

FCC REPORT

(LTE)

Applicant: OASYS Cybernetics Pvt. Ltd., Corp

Address of Applicant: OASYS Towers, No.3, Stringers road, Periyamet, Vepery,
Chennai – 600003.

Equipment Under Test (EUT)

Product Name: POS Terminal

Model No.: TEG9300-T

Trade Mark: Oasys

FCC ID: 2AYKQTEG9300-T

Applicable standards: FCC CFR Title 47 Part 2
FCC CFR Title 47 Part 22 Subpart H
FCC CFR Title 47 Part 27 Subpart M

Date of sample receipt: 19 Mar., 2021

Date of Test: 19 Mar., to 20 Apr., 2021

Date of report issued: 21 Apr., 2021

Test Result: PASS*

*In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Bruce Zhang
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the JYT product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful, and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

2. Version

Version No.	Date	Description
00	21 Apr., 2021	Original

Tested by:

Mike.ou
Test Engineer

Date:

21 Apr., 2021

Reviewed by:

Winner Zhang
Project Engineer

Date:

21 Apr., 2021

3. Contents

	Page
1. COVER PAGE	1
2. VERSION.....	2
3. CONTENTS.....	3
4. TEST SUMMARY	4
5. GENERAL INFORMATION	5
5.1 CLIENT INFORMATION.....	5
5.2 GENERAL DESCRIPTION OF E.U.T.....	5
5.3 TEST ENVIRONMENT AND MODE	8
5.4 DESCRIPTION OF SUPPORT UNITS.....	8
5.5 MEASUREMENT UNCERTAINTY.....	8
5.6 RELATED SUBMITTAL(S) / GRANT (S)	8
5.7 ADDITIONS TO, DEVIATIONS, OR EXCLUSIONS FROM THE METHOD	8
5.8 LABORATORY FACILITY	8
5.9 LABORATORY LOCATION	9
5.10 TEST INSTRUMENTS LIST	9
6. TEST RESULTS.....	10
6.1 CONDUCTED OUTPUT POWER, ERP AND EIRP	10
6.2 PEAK-TO-AVERAGE RATIO	15
6.3 OCCUPY BANDWIDTH	17
6.4 OUT OF BAND EMISSION AT ANTENNA TERMINALS	36
6.5 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT.....	53
6.6 FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT.....	59
6.7 FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT	62
7 TEST SETUP PHOTO.....	64
8 EUT CONSTRUCTIONAL DETAILS	65

4. Test Summary

Test Items	Section in CFR 47	Result
RF Exposure (SAR)	Part 1.1307 Part 2.1093	Passed (Please refer to SAR Report)
RF Output Power	Part 2.1046 Part 22.913 (a)(5) Part 27.50 (h)(2)	Pass
Peak-to-Average Ratio	Part 22.913 (d) Part 27.50(d)(5)	Pass
Modulation Characteristics	Part 2.1047	Pass
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 22.917(b) Part 27.53(m)	Pass
Out of band emission at antenna terminals	Part 2.1053 Part 22.917(a) Part 27.53(m)	Pass
Field strength of spurious radiation	Part 22.917(a) Part 27.53(m)	Pass
Frequency stability vs. temperature	Part 22.355 Part 27.54 Part 2.1055(a)(1)(b)	Pass
Frequency stability vs. voltage	Part 22.355 Part 27.54 Part 2.1055(d)(2)	Pass
Remark: 1. Pass: The EUT complies with the essential requirements in the standard. 2. The cable insertion loss used by "RF Output Power" and other conduction measurement items is 0.5dB(Fundamental Frequency below 1GHz)/1.0dB(Fundamental Frequency above 1GHz) (provided by the customer).		
Test Method:	ANSI/TIA-603-E-2016 ANSI C63.26-2015	

5. General Information

5.1 Client Information

Applicant:	OASYS Cybernetics Pvt. Ltd., Corp
Address:	OASYS Towers, No.3, Stringers road, Periyamet, Vepery, Chennai – 600003.
Manufacturer:	XCHENG TECH CO., LIMITED
Address:	ROOM 401F, Building 5, No.3000 LONG DONG Avenue, Pudong New District, Shanghai
Factory:	Sichuan XCheng Intelligent Technology Co., Ltd.
Address:	Plant No. 2, Zone A, Intelligent Terminal Demonstration Park, West Gangyuan Road, Lingang Economic Development District, Yibin City, Sichuan Province

5.2 General Description of E.U.T.

Product Name:	POS Terminal		
Model No.:	TEG9300-T		
Operation Frequency range:	LTE Band 5: TX: 824MHz-849MHz RX: 869MHz-894MHz LTE Band 41: TX: 2535MHz-2655MHz RX: 2535 MHz-2655 MHz		
Modulation type:	☒ QPSK	☒ 16QAM	☒ 64QAM
Antenna type:	Internal Antenna		
Antenna gain:	LTE Band 5: -0.18 dBi(declare by Applicant) LTE Band 41: 0.95 dBi(declare by Applicant)		
Power supply:	Rechargeable Lithium Battery DC3.6V, 5200mAh		
AC adapter:	Model: ES568-U050200XYF Input: AC100-240V, 50/60Hz, 0.5A Output: DC 5.0V, 2000mA		
Test Sample Condition:	The applicant provided engineering samples for staying in continuously transmitting for testing.		

Operation Frequency List:

LTE Band 5 (1.4MHz)		LTE Band 5 (3MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
20407	824.70	20415	825.50
20408	824.80	20416	825.60
....			
20524	836.40	20524	836.40
20525	836.50	20525	836.50
20526	836.60	20526	836.60
...	...	...	...
20642	848.20	20634	847.40
20643	848.30	20635	847.50
LTE Band 5 (5MHz)		LTE Band 5 (10MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
20425	826.50	20450	829.00
20426	826.60	20451	829.10
....			
20524	836.40	20524	836.40
20525	836.50	20525	836.50
20526	836.60	20526	836.60
...	...	...	...
20624	846.40	20599	839.90
20625	846.50	20600	844.00

LTE Band 41 (5MHz)		LTE Band 41 (10MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
40065	2537.50	40090	2540.00
40066	2537.60	40091	2540.10
....			
40639	2594.90	40639	2594.90
40640	2595.00	40640	2595.00
40641	2595.10	40641	2595.10
...	...	...	...
41214	2652.40	41189	2649.90
41215	2652.50	41190	2650.00
LTE Band 41 (15MHz)		LTE Band 41 (20MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
40115	2542.50	40140	2545.00
40116	2542.60	40141	2545.10
....			
40639	2594.90	40639	2594.90
40640	2595.00	40640	2595.00
40641	2595.10	40641	2595.10
...	...	...	...
41164	2647.40	41139	2644.90
41165	2647.50	41140	2645.00

Regards to the operating frequency range, the lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channels as below:

LTE Band 5 (1.4MHz)			LTE Band 5 (3MHz)		
Channel:		Frequency (MHz)	Channel		Frequency (MHz)
Lowest channel	20407	824.70	Lowest channel	20415	825.50
Middle channel	20525	836.50	Middle channel	20525	836.50
Highest channel	20643	848.30	Highest channel	20635	847.50
LTE Band 5 (5MHz)			LTE Band 5 (10MHz)		
Channel		Frequency (MHz)	Channel		Frequency (MHz)
Lowest channel	20425	826.50	Lowest channel	20450	829.00
Middle channel	20525	836.50	Middle channel	20525	836.50
Highest channel	20625	846.50	Highest channel	20600	844.00

LTE Band 41 (5MHz)			LTE Band 41 (10MHz)		
Channel		Frequency (MHz)	Channel		Frequency (MHz)
Lowest channel	40065	2537.50	Lowest channel	40090	2540.00
Middle channel	40640	2595.00	Middle channel	40640	2595.00
Highest channel	41215	2652.50	Highest channel	41190	2650.00
LTE Band 41 (15MHz)			LTE Band 41 (20MHz)		
Channel		Frequency (MHz)	Channel		Frequency (MHz)
Lowest channel	40115	2542.50	Lowest channel	40140	2545.00
Middle channel	40640	2595.00	Middle channel	40640	2595.00
Highest channel	41165	2647.50	Highest channel	41140	2645.00

5.3 Test environment and mode

Operating Environment:	
Temperature:	Normal: 15°C ~ 35°C, Extreme: -30°C ~ +50°C
Humidity:	20 % ~ 75 % RH
Atmospheric Pressure:	1008 mbar
Voltage:	Nominal: 3.6Vdc, Extreme: Low 3.5Vdc, High 4.20Vdc
Test mode:	
LTE QPSK mode	Keep the EUT communication with simulated station in QPSK mode
LTE 16-QAM mode	Keep the EUT communication with simulated station in 16-QAM mode
Remark: The EUT has been tested under continuous transmitting mode. Channel Low, Mid and High for each type band with rated data rate were chosen for full testing. The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for these modes. Just the worst case position (H mode) shown in report.	

5.4 Description of Support Units

Test Equipment	Manufacturer	Model No.	Serial No.
Simulated Station	Anritsu	MT8820C	6201026545

5.5 Measurement Uncertainty

Parameters	Expanded Uncertainty
Radiated Emission (9kHz ~ 30MHz)	±3.12 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	±4.32 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	±5.16 dB (k=2)
Radiated Emission (18GHz ~ 40GHz)	±3.20 dB (k=2)

5.6 Related Submittal(s) / Grant (s)

This is an original grant, no related submittals and grants.
--

5.7 Additions to, deviations, or exclusions from the method

No

5.8 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations: ● FCC - Designation No.: CN1211 JianYan Testing Group Shenzhen Co., Ltd. has been accredited as a testing laboratory by FCC (Federal Communications Commission). The test firm Registration No. is 727551. ● ISED – CAB identifier.: CN0021 The 3m Semi-anechoic chamber of JianYan Testing Group Shenzhen Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1. ● A2LA - Registration No.: 4346.01 This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: https://portal.a2la.org/scopepdf/4346-01.pdf

5.9 Laboratory Location

JianYan Testing Group Shenzhen Co., Ltd.

Address: No.101, Building 8, Innovation Wisdom Port, No.155 Hongtian Road, Huangpu Community, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, People's Republic of China.

Tel: +86-755-23118282, Fax: +86-755-23116366

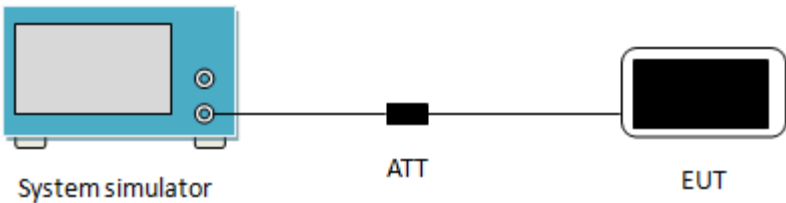
Email: info@ccis-cb.com, Website: <http://www.ccis-cb.com>

5.10 Test Instruments list

Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
3m SAC	ETS	9m*6m*6m	966	01-19-2021	01-18-2024
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-03-2021	03-02-2022
Biconical Antenna	SCHWARZBECK	VUBA9117	359	06-18-2020	06-17-2021
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-03-2021	03-02-2022
Horn Antenna	SCHWARZBECK	BBHA9120D	1805	06-18-2020	06-17-2021
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170582	11-18-2020	11-17-2021
EMI Test Software	AUDIX	E3	Version: 6.110919b		
Pre-amplifier	HP	8447D	2944A09358	03-03-2021	03-02-2022
Pre-amplifier	CD	PAP-1G18	11804	03-03-2021	03-02-2022
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-03-2021	03-02-2022
Spectrum analyzer	Rohde & Schwarz	FSP40	100363	11-18-2020	11-17-2021
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-03-2021	03-02-2022
Spectrum Analyzer	Agilent	N9020A	MY50510123	11-18-2020	11-17-2021
Signal Generator	Rohde & Schwarz	SMX	835454/016	03-03-2021	03-02-2022
Signal Generator	R&S	SMR20	1008100050	03-03-2021	03-02-2022
RF Switch Unit	MWRFTTEST	MW200	N/A	N/A	N/A
Test Software	MWRFTTEST	MTS8200	Version: 2.0.0.0		
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-03-2021	03-02-2022
Cable	MICRO-COAX	MFR64639	K10742-5	03-03-2021	03-02-2022
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-03-2021	03-02-2022
DC Power Supply	XinNuoEr	WYK-10020K	1409050110020	09-25-2020	09-24-2021
Temperature Humidity Chamber	HengPu	HPGDS-500	20140828008	11-01-2020	10-31-2021
Simulated Station	Rohde & Schwarz	CMW500	140493	07-22-2020	07-21-2021

6. Test results

6.1 Conducted Output Power, ERP and EIRP

Test Requirement:	Part 22.913(a)(5), Part 27.50 (h)(2)
Limit:	LTE Band 5: 7W, LTE Band 41: 2W
Test Setup:	 The diagram illustrates the test setup. On the left is a blue 'System simulator' box with two ports. A red line connects one of its ports to a black 'ATT' (attenuator) box. Another red line connects the 'ATT' box to a black 'EUT' (Equipment Under Test) box on the right.
Test Procedure:	The transmitter output was connected to a calibrated attenuator, the other end of which was connected to the CMW500. Transmitter output power was read off in dBm.
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

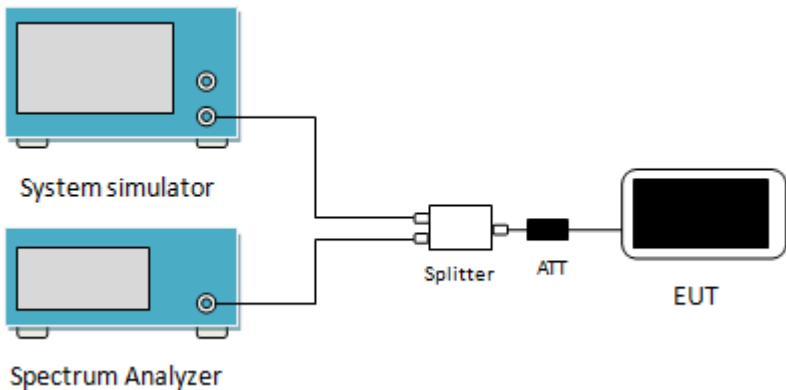
LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)			
					20407	20525	20643	
					824.7MHz	836.5MHz	848.3MHz	
5	1.4	QPSK	1	0	23.35	23.22	23.33	
			1	2	23.58	23.36	23.29	
			1	5	23.30	23.21	23.31	
			3	0	22.44	22.34	22.46	
			3	1	22.39	22.34	22.46	
			3	2	22.40	22.31	22.44	
			6	0	22.35	22.22	22.38	
		Antenna Gain(dBi):				-0.18		
		Max. ERP (dBm):				21.25		
		ERP Limit (dBm):				38.45		
		16QAM	1	0	22.16	22.18	22.25	
			1	2	22.31	22.32	22.46	
			1	5	22.13	22.18	22.26	
			3	0	21.24	21.12	21.31	
			3	1	21.26	21.16	21.30	
			3	2	21.21	21.15	21.29	
			6	0	21.17	21.08	21.15	
		Antenna Gain(dBi):				-0.18		
		Max. ERP (dBm):				20.13		
		ERP Limit (dBm):				38.45		
LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)			
					20415	20525	20635	
					825.5MHz	836.5MHz	847.50MHz	
5	3	QPSK	1	0	23.29	23.32	23.44	
			1	7	23.21	23.31	23.40	
			1	14	23.26	23.38	23.43	
			8	0	22.23	22.29	22.39	
			8	4	22.24	22.27	22.44	
			8	7	22.31	22.30	22.45	
			15	0	22.19	22.20	22.25	
		Antenna Gain(dBi):				-0.18		
		Max. ERP (dBm):				21.11		
		ERP Limit (dBm):				38.45		
		16QAM	1	0	22.26	22.12	22.23	
			1	7	22.26	22.12	22.28	
			1	14	22.21	22.16	22.28	
			8	0	21.31	21.26	21.43	
			8	4	21.28	21.28	21.41	
			8	7	21.29	21.28	21.45	
			15	0	21.26	21.23	21.33	
		Antenna Gain(dBi):				-0.18		
		Max. ERP (dBm):				19.95		
		ERP Limit (dBm):				38.45		
Note: EIRP (dBm) = Average power (dBm) + Antenna Gain (dBi). ERP (dBm) = EIRP (dBm) - 2.15 (dB).								

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)			
					20425	20525	20625	
					826.5MHz	836.5MHz	846.5MHz	
5	5	QPSK	1	0	23.26	23.14	23.33	
			1	12	23.35	23.26	23.47	
			1	24	23.23	23.19	23.36	
			12	0	22.27	22.31	22.41	
			12	6	22.26	22.31	22.44	
			12	11	22.26	22.32	22.36	
			25	0	22.18	22.27	22.25	
		Antenna Gain(dBi):				-0.18		
		Max. ERP (dBm):				21.14		
		ERP Limit (dBm):				38.45		
		16QAM	1	0	22.15	22.20	22.30	
			1	12	22.28	22.37	22.40	
			1	24	22.16	22.33	22.34	
			12	0	21.22	21.35	21.44	
			12	6	21.22	21.34	21.42	
			12	11	21.21	21.33	21.41	
			25	0	21.11	21.29	21.32	
		Antenna Gain(dBi):				-0.18		
		Max. ERP (dBm):				20.07		
ERP Limit (dBm):				38.45				
LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)			
					20450	20525	20600	
					829.0MHz	836.5MHz	844.0MHz	
5	10	QPSK	1	0	23.25	23.29	23.28	
			1	24	23.37	23.53	23.54	
			1	49	23.21	23.41	23.39	
			25	0	22.25	22.30	22.47	
			25	12	22.27	22.27	22.49	
			25	24	22.30	22.25	22.51	
			50	0	22.21	22.16	22.41	
		Antenna Gain(dBi):				-0.18		
		Max. ERP (dBm):				21.21		
		ERP Limit (dBm):				38.45		
		16QAM	1	0	22.28	22.10	22.09	
			1	24	22.32	22.26	22.30	
			1	49	22.27	22.30	22.18	
			25	0	21.32	21.32	21.56	
			25	12	21.31	21.32	21.53	
			25	24	21.31	21.29	21.53	
			50	0	21.24	21.20	21.38	
		Antenna Gain(dBi):				-0.18		
		Max. ERP (dBm):				19.99		
ERP Limit (dBm):				38.45				
Note: EIRP (dBm) = Average power (dBm) + Antenna Gain (dBi).								
ERP (dBm) = EIRP (dBm) - 2.15 (dB).								

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)			
					40065	40640	41215	
					2537.50MHz	2595.00MHz	2652.50MHz	
41	5	QPSK	1	0	21.52	21.40	21.46	
			1	12	21.48	21.54	21.60	
			1	24	21.62	21.39	21.46	
			12	0	20.46	20.45	20.49	
			12	6	20.54	20.49	20.49	
			12	11	20.53	20.46	20.47	
			25	0	20.39	20.40	20.42	
		Antenna Gain (dBi):				0.95		
		Max. EIRP (dBm):				22.57		
		EIRP Limit (dBm):				33.00		
		16QAM	1	0	20.42	20.35	20.33	
			1	12	20.55	20.46	20.48	
			1	24	20.55	20.34	20.36	
			12	0	19.55	19.40	19.42	
			12	6	19.53	19.48	19.45	
			12	11	19.52	19.48	19.45	
			25	0	19.45	19.39	19.41	
Antenna Gain (dBi):				0.95				
Max. EIRP (dBm):				21.50				
EIRP Limit (dBm):				33.00				
LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)			
					40090	40640	41190	
					2540.00MHz	2595.00MHz	2650.00MHz	
41	10	QPSK	1	0	21.53	21.51	21.49	
			1	24	21.83	21.74	21.74	
			1	49	21.61	21.48	21.53	
			25	0	20.69	20.52	20.50	
			25	12	20.69	20.48	20.60	
			25	24	20.70	20.48	20.51	
			50	0	20.64	20.41	20.52	
		Antenna Gain (dBi):				0.95		
		Max. EIRP (dBm):				22.78		
		EIRP Limit (dBm):				33.00		
		16QAM	1	0	20.60	20.32	20.28	
			1	24	20.87	20.59	20.50	
			1	49	20.65	20.32	20.30	
			25	0	19.64	19.48	19.52	
			25	12	19.66	19.46	19.52	
			25	24	19.67	19.45	19.52	
			50	0	19.54	19.40	19.43	
Antenna Gain (dBi):				0.95				
Max. EIRP (dBm):				21.82				
EIRP Limit (dBm):				33.00				
Note: EIRP (dBm) = Average power (dBm) + Antenna Gain (dBi).								

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)			
					40115	40640	41165	
					2542.50MHz	2595.00MHz	2647.50MHz	
41	15	QPSK	1	0	21.47	21.43	21.43	
			1	37	21.60	21.53	21.56	
			1	74	21.43	21.41	21.42	
			36	0	20.65	20.41	20.40	
			36	16	20.71	20.50	20.52	
			36	35	20.75	20.39	20.49	
			75	0	20.44	20.33	20.34	
		Antenna Gain (dBi):				0.95		
		Max. EIRP (dBm):				22.55		
		EIRP Limit (dBm):				33.00		
		16QAM	1	0	20.63	20.20	20.43	
			1	37	20.76	20.33	20.55	
			1	74	20.60	20.17	20.39	
			36	0	19.65	19.41	19.45	
			36	16	19.74	19.38	19.39	
			36	35	19.76	19.32	19.59	
			75	0	19.54	19.21	19.23	
Antenna Gain (dBi):				0.95				
Max. EIRP (dBm):				21.71				
EIRP Limit (dBm):				33.00				
LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)			
					40140	40640	41140	
					2545.00MHz	2595.00MHz	2645.00MHz	
41	20	QPSK	1	0	21.55	21.51	21.61	
			1	49	21.88	21.68	21.83	
			1	99	21.71	21.63	21.57	
			50	0	20.57	20.47	20.50	
			50	24	20.58	20.43	20.47	
			50	49	20.60	20.50	20.47	
			100	0	20.49	20.35	20.36	
		Antenna Gain (dBi):				0.95		
		Max. EIRP (dBm):				22.83		
		EIRP Limit (dBm):				33.00		
		16QAM	1	0	20.59	20.54	20.49	
			1	49	20.53	20.53	20.69	
			1	99	20.61	20.47	20.58	
			50	0	19.61	19.50	19.44	
			50	24	19.58	19.52	19.48	
			50	49	19.57	19.49	19.48	
			100	0	19.48	19.46	19.37	
Antenna Gain (dBi):				0.95				
Max. EIRP (dBm):				21.64				
EIRP Limit (dBm):				33.00				
Note: EIRP (dBm) = Average power (dBm) + Antenna Gain (dBi).								

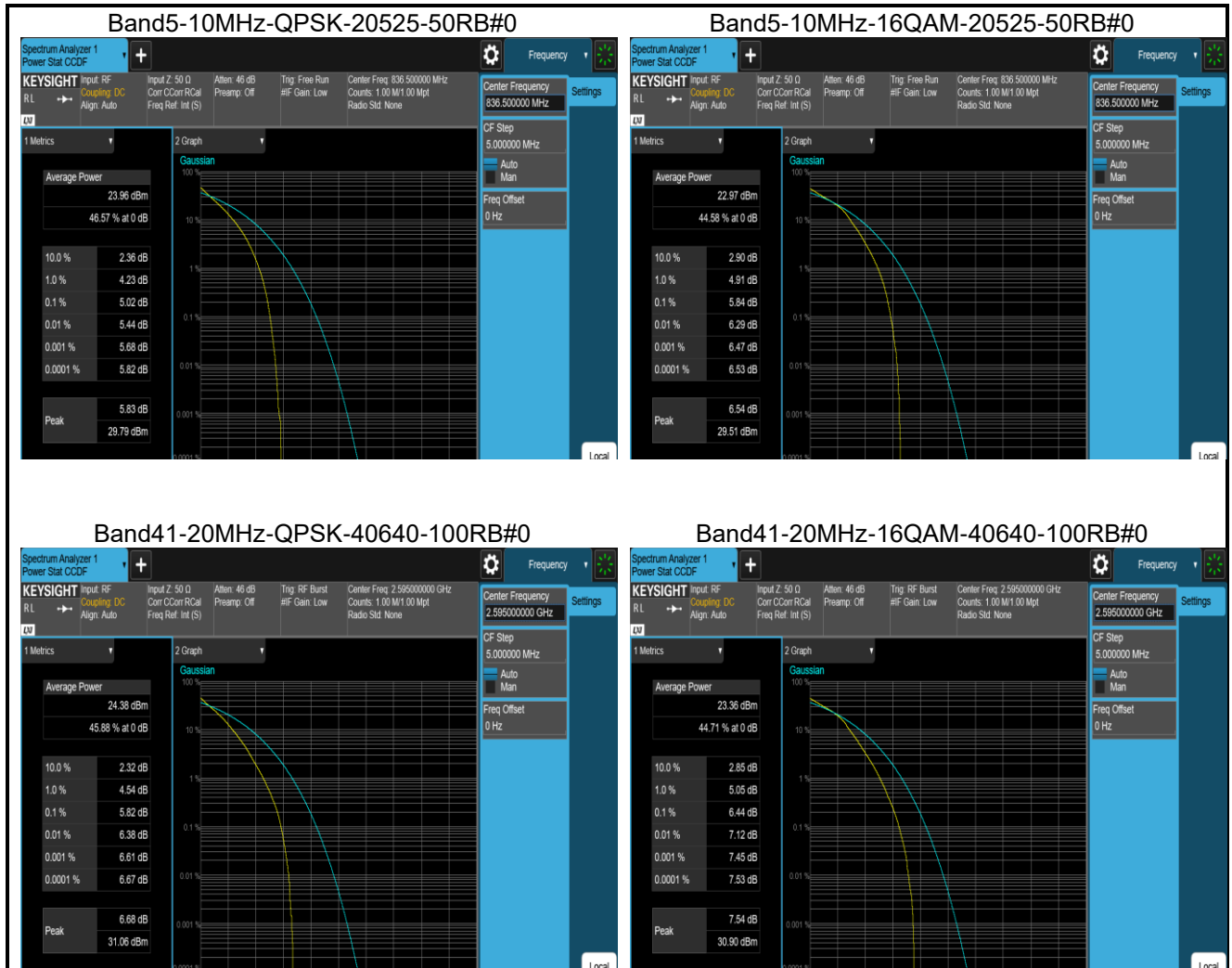
6.2 Peak-to-Average Ratio

Test Requirement:	Part 22.913 (d), Part 27.50(d)(5)
Limit:	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.
Test Setup:	
Test Procedure:	1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 2 Set the CCDF option in spectrum analyzer, $RBW \geq OBW$, 3 Set the EUT working in highest power level, measured and recorded the 0.1% as PAPR level. 4 Repeat step 1~3 at other frequency and modulations.
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

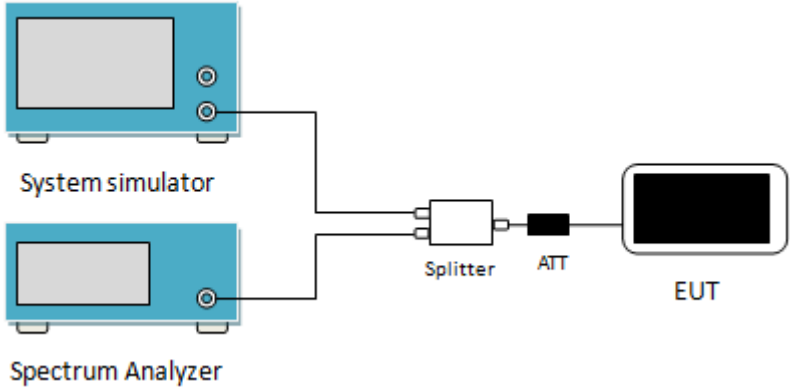
Measurement Data (Worst case):

Bandwidth	Modulation	RB Size	RB Offset	PAPR
LTE Band 5 (Middle Channel)				
10MHz	QPSK	50	0	5.02
	16QAM	50	0	5.84
LTE Band 41 (Middle Channel)				
20MHz	QPSK	100	0	5.82
	16QAM	100	0	6.44

Test plots as below:



6.3 Occupy Bandwidth

Test Requirement:	Part 22.917(b), Part 27.53(m)
Test Setup:	 The diagram illustrates the test setup. On the left, there are two blue rectangular units: the top one is labeled 'System simulator' and the bottom one is labeled 'Spectrum Analyzer'. Both have a single output port on their right side. These two ports are connected to a single input port of a white rectangular unit labeled 'Splitter'. The 'Splitter' has two output ports on its right side. One output port is connected to a black rectangular unit labeled 'ATT' (Attenuator). The other output port is connected to a white rectangular unit with a black screen, labeled 'EUT' (Equipment Under Test).
Test Procedure:	1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer 2. RBW was set to about 1% ~ 5% of emission BW, VBW= 3 times RBW. 3. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

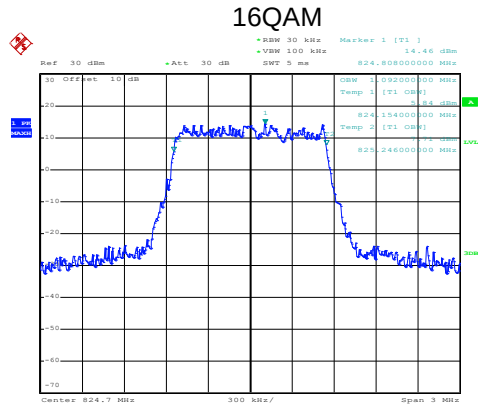
TE Band 5					
Bandwidth	Channel	Frequency (MHz)	Modulation	99% OBW (kHz)	-26dBcEBW (kHz)
1.4MHz	20407	824.7	16QAM	1092	1272
			QPSK	1098	1284
	20525	836.5	16QAM	1092	1290
			QPSK	1098	1278
	20643	848.3	16QAM	1092	1260
			QPSK	1092	1290
3MHz	20415	825.5	16QAM	2724	2940
			QPSK	2712	2980
	20525	836.50	16QAM	2724	2964
			QPSK	2712	3012
	20635	847.50	16QAM	2712	2952
			QPSK	2724	3000
5MHz	20425	826.50	16QAM	4480	4860
			QPSK	4500	4880
	20525	836.50	16QAM	4500	4880
			QPSK	4500	4880
	20625	846.50	16QAM	4460	4820
			QPSK	4480	4880
10MHz	20450	829.00	16QAM	9080	10400
			QPSK	9080	10000
	20525	836.50	16QAM	9120	10040
			QPSK	9080	10040
	20600	844.00	16QAM	9080	9960
			QPSK	9120	10080

LTE Band 41					
Bandwidth	Channel	Frequency (MHz)	Modulation	99% OBW (kHz)	-26dBcEBW (kHz)
5MHz	40065	2537.50	16QAM	4480	4840
			QPSK	4520	4800
	40640	2595.00	16QAM	4520	4800
			QPSK	4500	4860
	41215	2652.50	16QAM	4480	4820
			QPSK	4520	4860
10MHz	40090	2540.00	16QAM	9080	9920
			QPSK	9040	9960
	40640	2595.00	16QAM	9120	9960
			QPSK	9080	10040
	41190	2650.00	16QAM	9040	9960
			QPSK	9080	10000
15MHz	40115	2542.50	16QAM	13440	14460
			QPSK	13560	14640
	40640	2595.00	16QAM	13500	14580
			QPSK	13500	14640
	41165	2647.50	16QAM	13440	14520
			QPSK	13500	14640
20MHz	40140	2545.00	16QAM	17920	19120
			QPSK	18000	19200
	40640	2595.00	16QAM	17920	18960
			QPSK	18000	19280
	41140	2645.00	16QAM	17920	19040
			QPSK	17920	19200

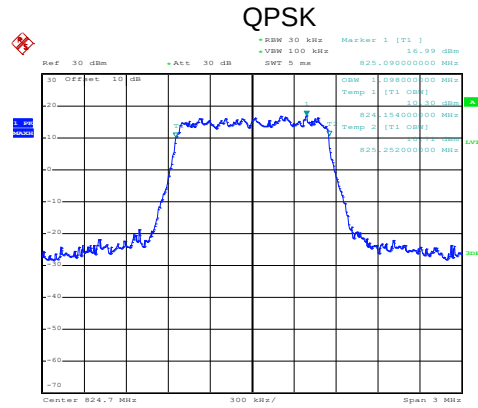
Test plot as follows:

LTE Band 5 part:

LTE Band 5: 99% Occupancy bandwidth
BW: 1.4MHz

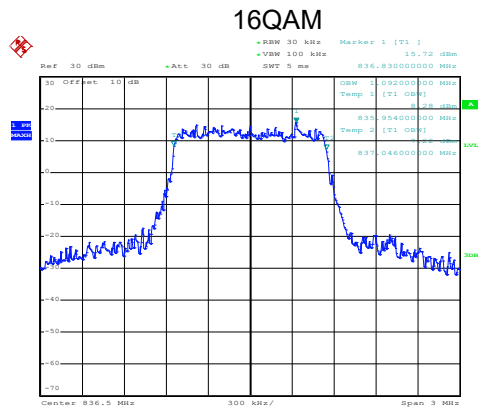


Date: 31.MAR.2021 16:39:37

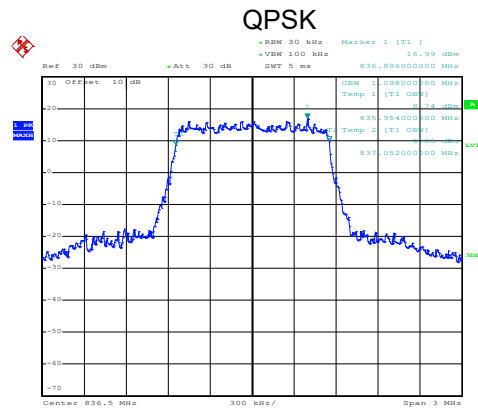


Date: 31.MAR.2021 16:39:33

Lowest channel

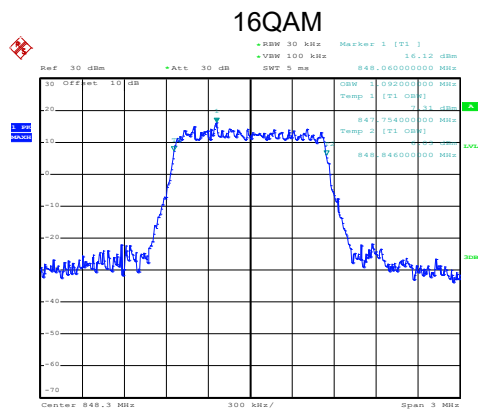


Date: 31.MAR.2021 16:40:17

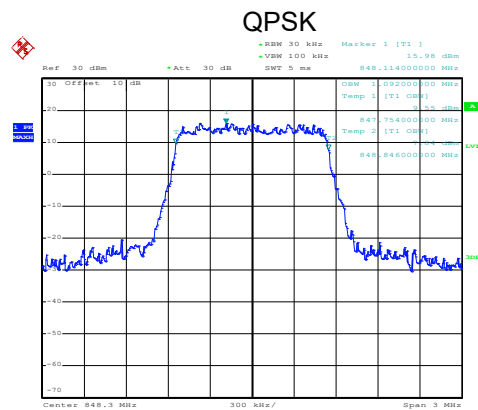


Date: 31.MAR.2021 16:40:13

Middle channel



Date: 31.MAR.2021 16:40:34

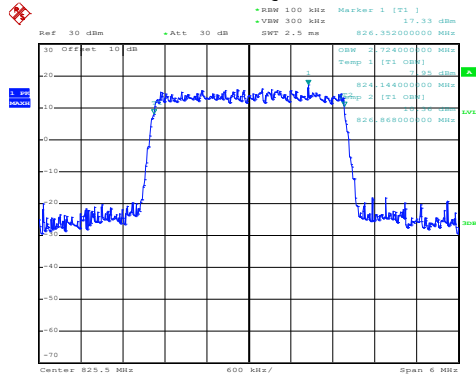


Date: 31.MAR.2021 16:40:30

Highest channel

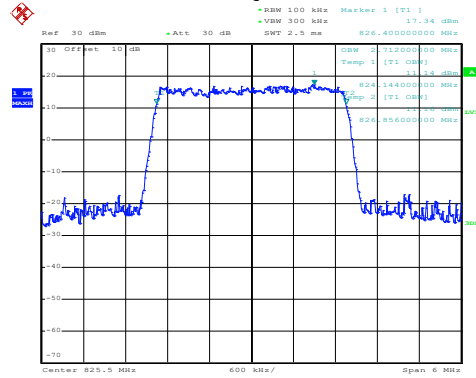
LTE Band 5: 99% Occupancy bandwidth BW: 3MHz

16QAM



Date: 31.MAR.2021 16:41:25

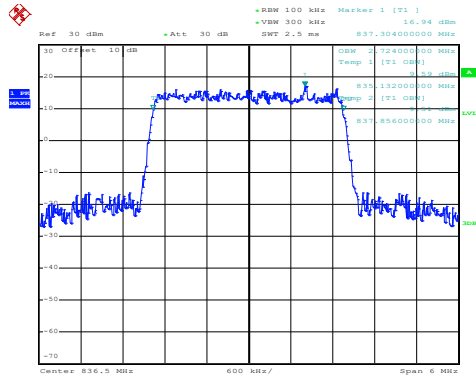
QPSK



Date: 31.MAR.2021 16:41:22

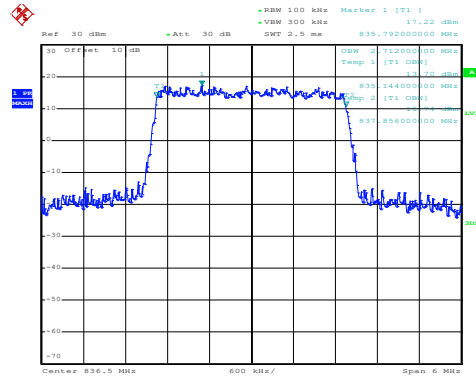
Lowest channel

16QAM



Date: 31.MAR.2021 16:41:37

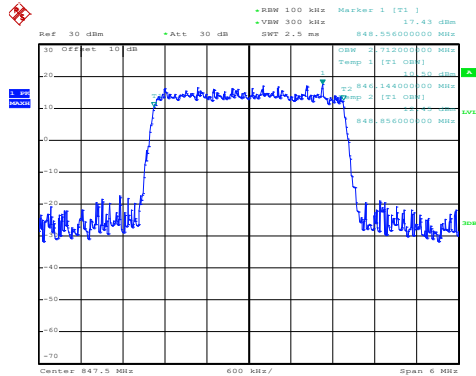
QPSK



Date: 31.MAR.2021 16:41:33

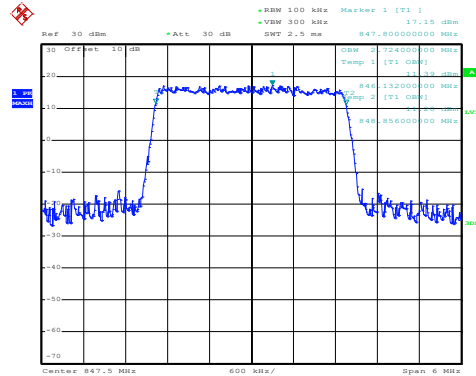
Middle channel

16QAM



Date: 31.MAR.2021 16:42:17

QPSK

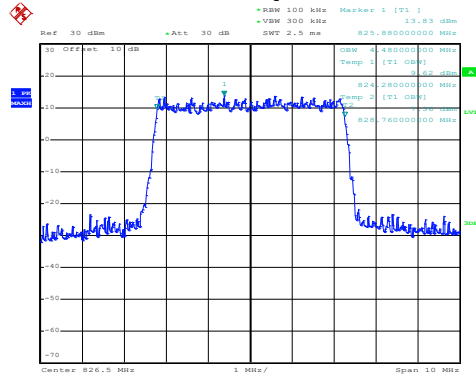


Date: 31.MAR.2021 16:42:13

Highest channel

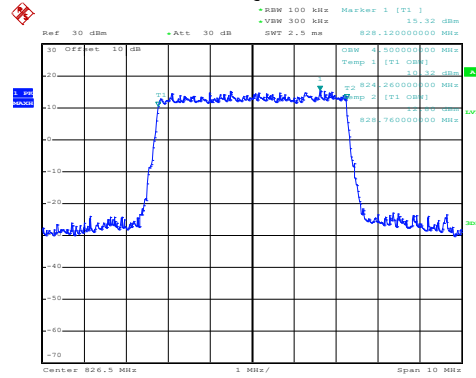
LTE Band 5: 99% Occupancy bandwidth
BW: 5MHz

16QAM



Date: 31.MAR.2021 16:42:36

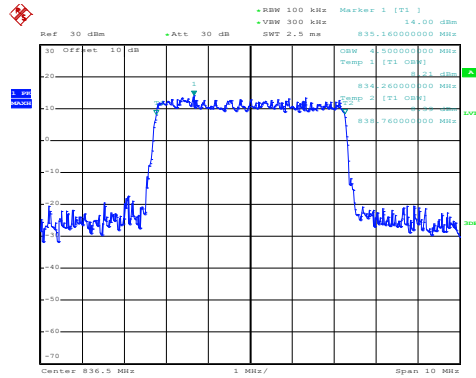
QPSK



Date: 31.MAR.2021 16:42:33

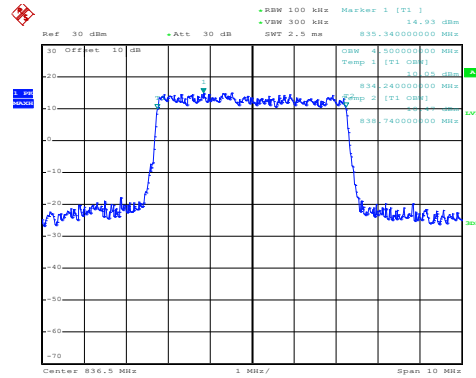
Lowest channel

16QAM



Date: 31.MAR.2021 16:43:05

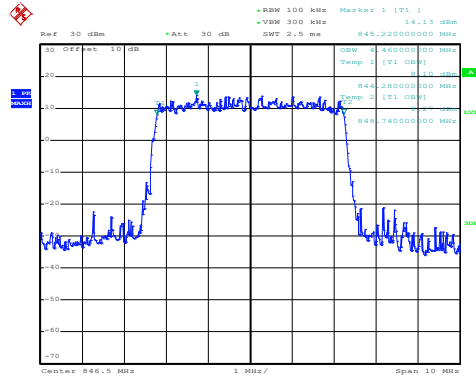
QPSK



Date: 31.MAR.2021 16:43:02

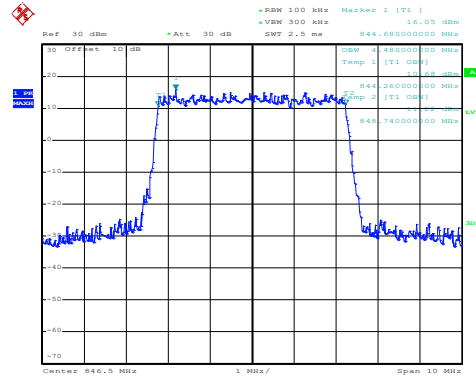
Middle channel

16QAM



Date: 31.MAR.2021 16:43:17

QPSK

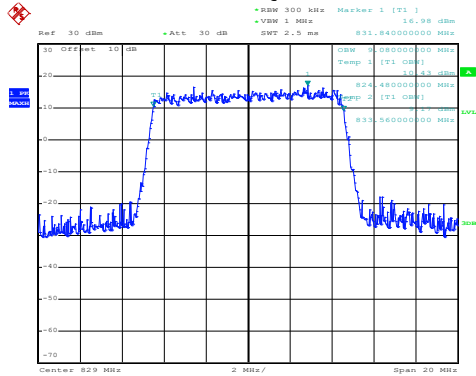


Date: 31.MAR.2021 16:43:14

Highest channel

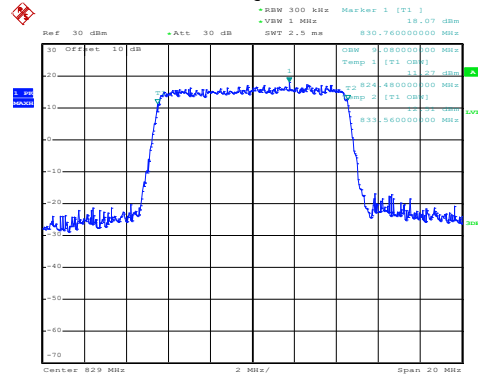
LTE Band 5: 99% Occupancy bandwidth BW: 10MHz

16QAM



Date: 31.MAR.2021 16:44:08

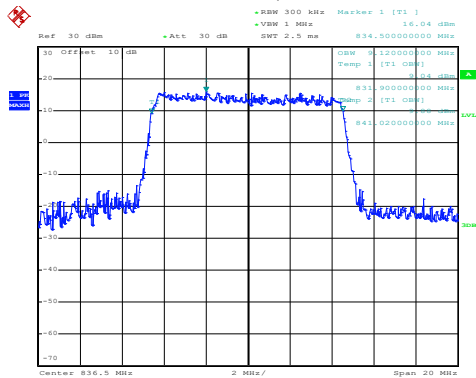
QPSK



Date: 31.MAR.2021 16:44:05

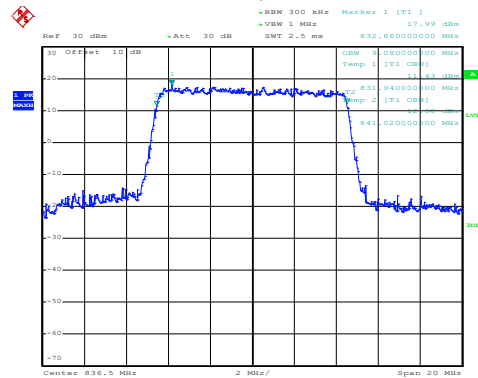
Lowest channel

16QAM



Date: 31.MAR.2021 16:44:36

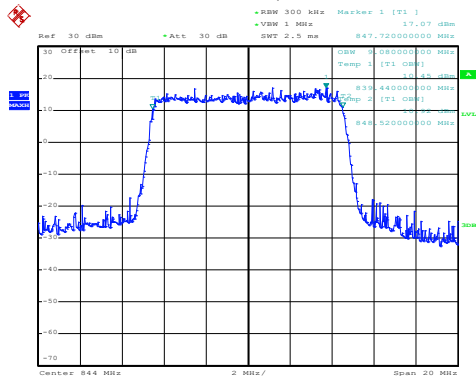
QPSK



Date: 31.MAR.2021 16:44:33

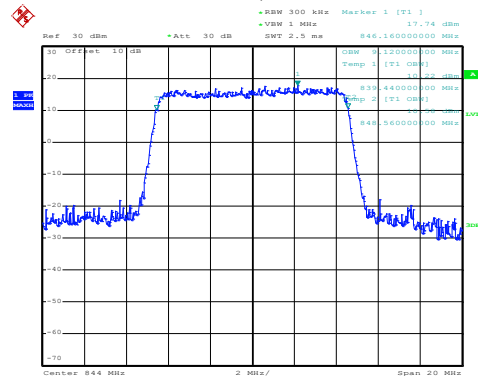
Middle channel

16QAM



Date: 31.MAR.2021 16:45:11

QPSK

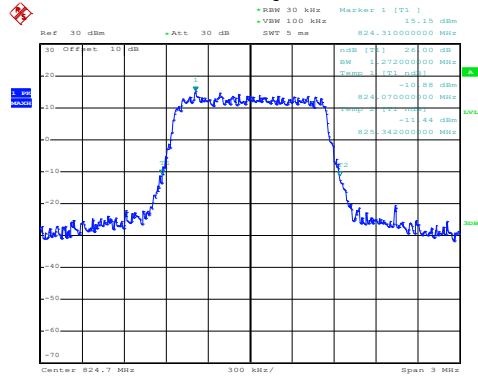


Date: 31.MAR.2021 16:45:07

Highest channel

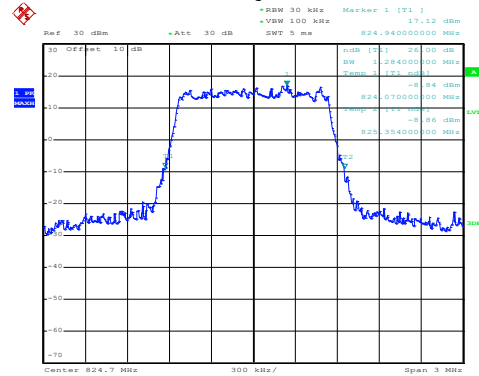
LTE Band 5: -26dBc bandwidth BW: 1.4MHz

16QAM



Date: 31.MAR.2021 16:39:49

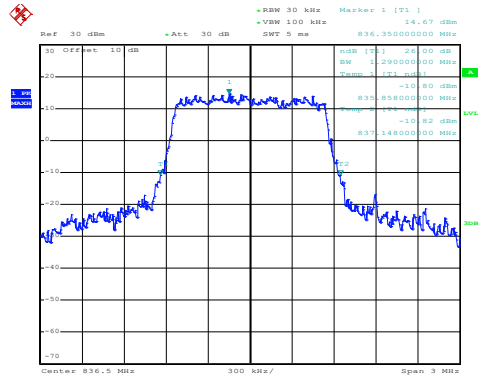
QPSK



Date: 31.MAR.2021 16:39:44

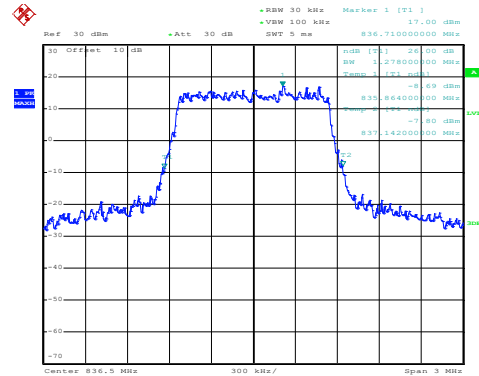
Lowest channel

16QAM



Date: 31.MAR.2021 16:40:08

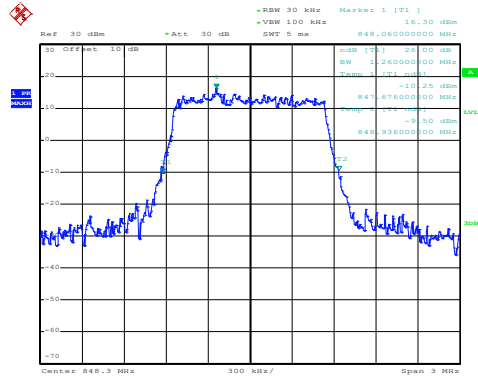
QPSK



Date: 31.MAR.2021 16:40:04

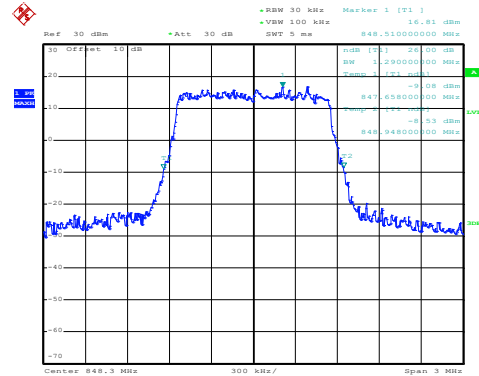
Middle channel

16QAM



Date: 31.MAR.2021 16:40:46

QPSK

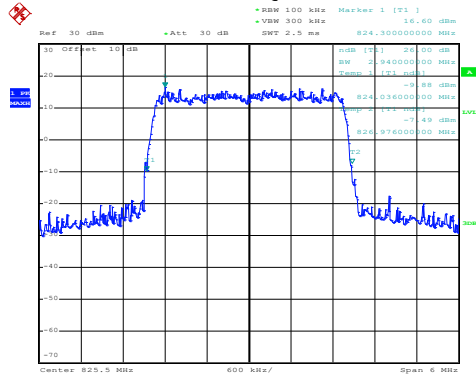


Date: 31.MAR.2021 16:40:42

Highest channel

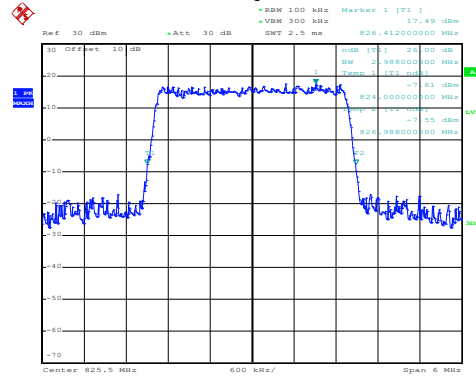
LTE Band 5: -26dBc bandwidth
BW: 3MHz

16QAM



Date: 31.MAR.2021 16:41:14

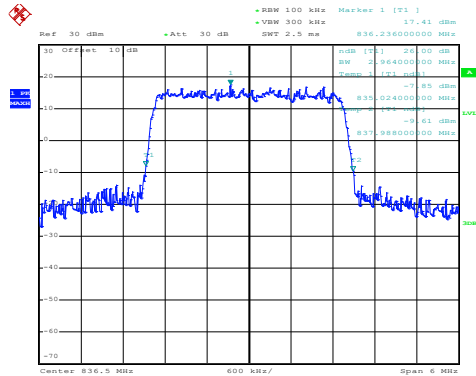
QPSK



Date: 31.MAR.2021 16:41:11

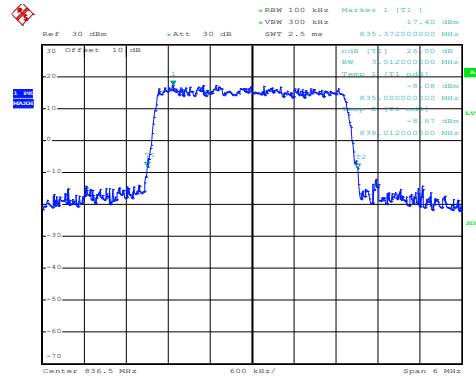
Lowest channel

16QAM



Date: 31.MAR.2021 16:41:49

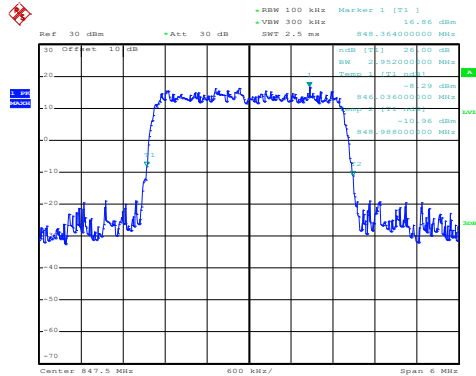
QPSK



Date: 31.MAR.2021 16:41:43

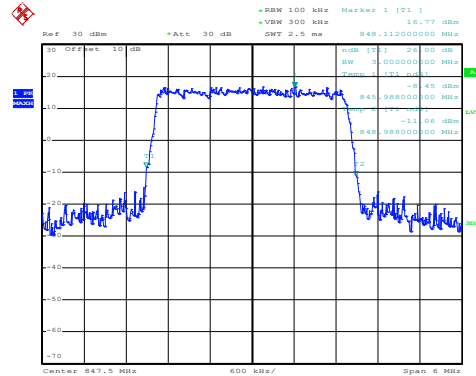
Middle channel

16QAM



Date: 31.MAR.2021 16:42:04

QPSK

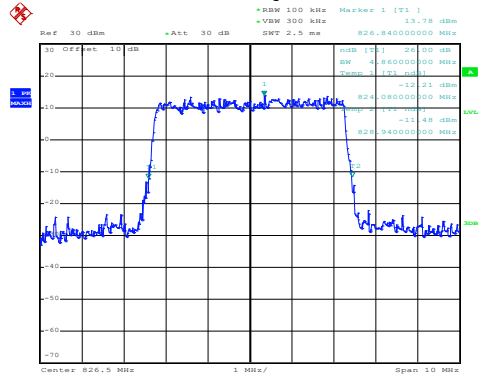


Date: 31.MAR.2021 16:42:01

Highest channel

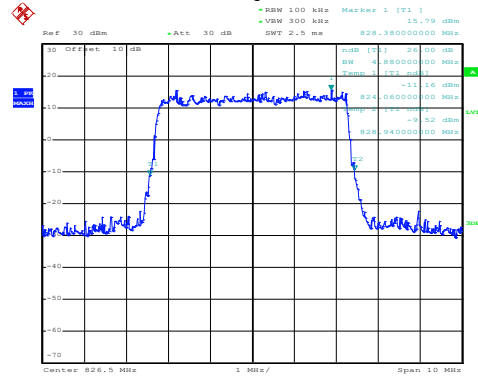
LTE Band 5: -26dBc bandwidth
BW: 5MHz

16QAM



Date: 31.MAR.2021 16:42:45

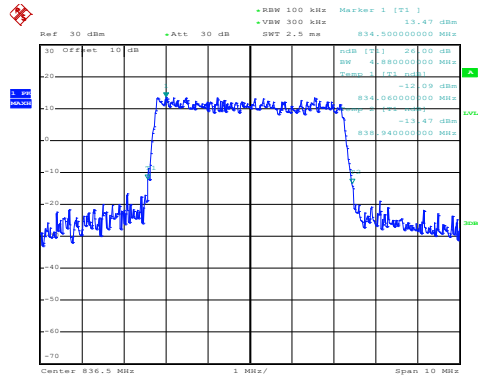
QPSK



Date: 31.MAR.2021 16:42:42

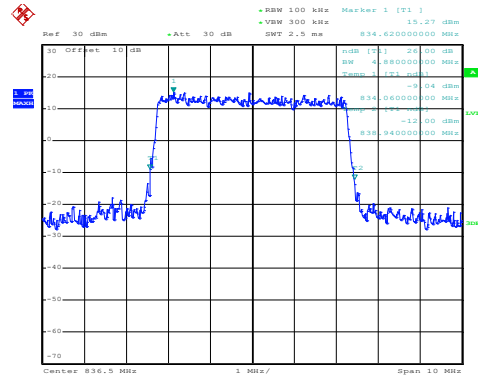
Lowest channel

16QAM



Date: 31.MAR.2021 16:42:56

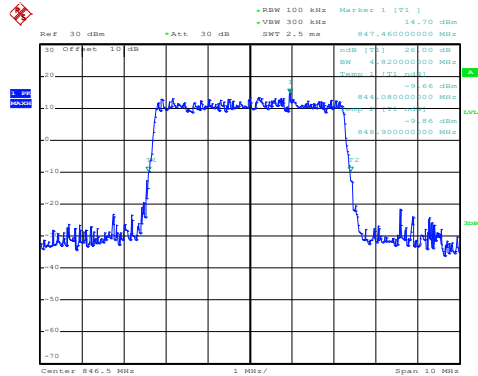
QPSK



Date: 31.MAR.2021 16:42:53

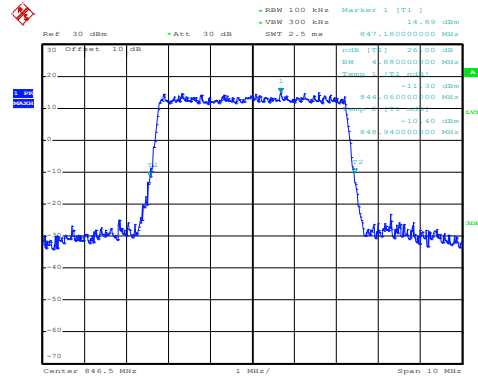
Middle channel

16QAM



Date: 31.MAR.2021 16:43:26

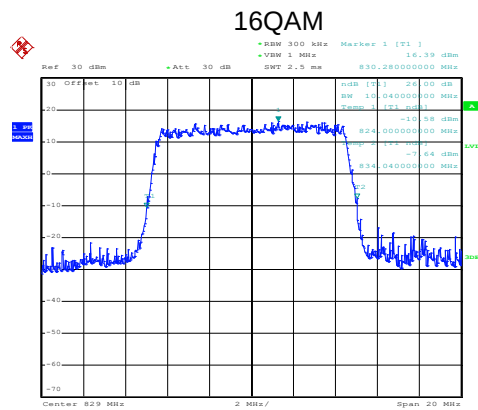
QPSK



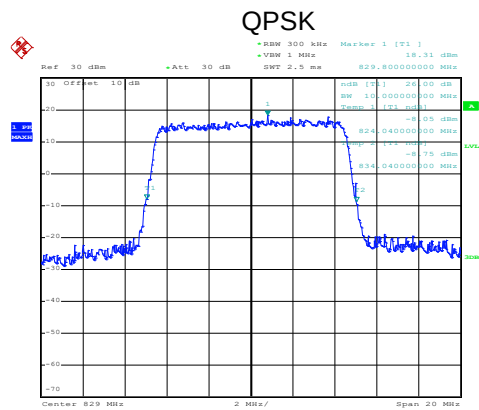
Date: 31.MAR.2021 16:43:23

Highest channel

LTE Band 5: -26dBc bandwidth
BW: 10MHz

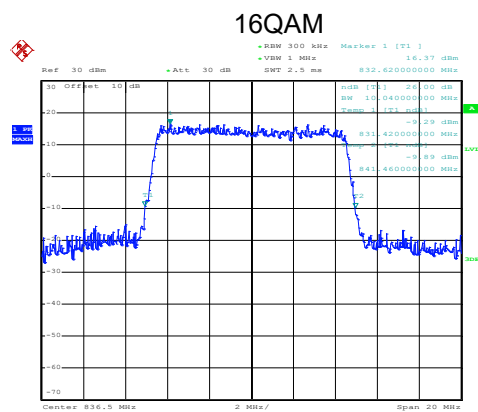


Date: 31.MAR.2021 16:43:59

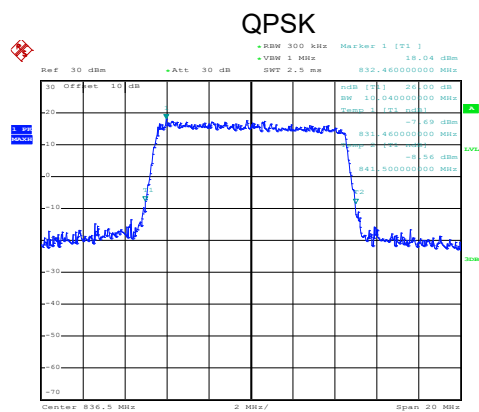


Date: 31.MAR.2021 16:43:56

Lowest channel

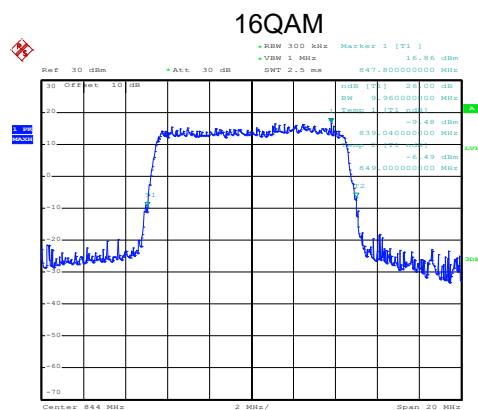


Date: 31.MAR.2021 16:44:46

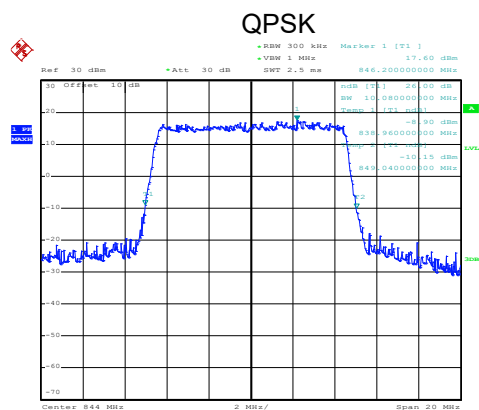


Date: 31.MAR.2021 16:44:43

Middle channel



Date: 31.MAR.2021 16:45:00

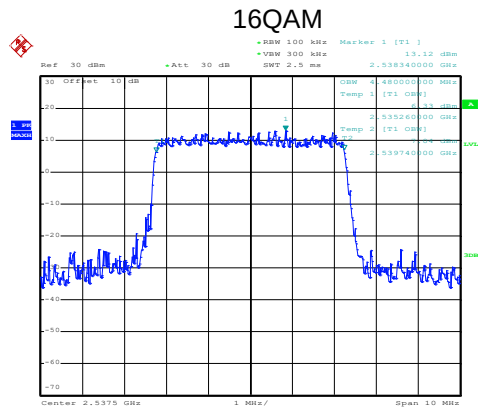


Date: 31.MAR.2021 16:44:57

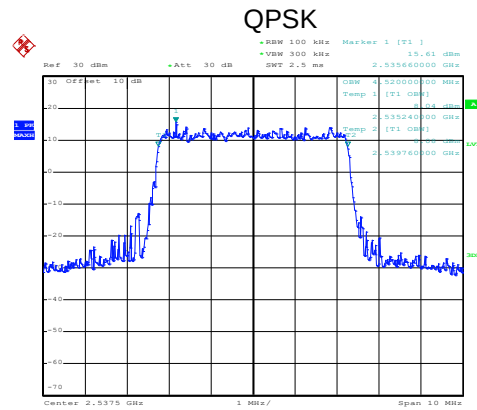
Highest channel

LTE-Band 41 part:

LTE Band 41: 99% Occupy bandwidth BW: 5MHz

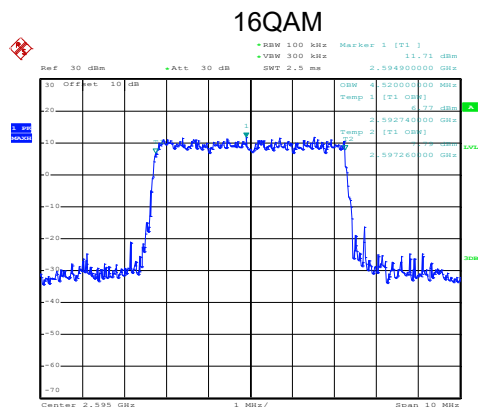


Date: 31.MAR.2021 16:45:47

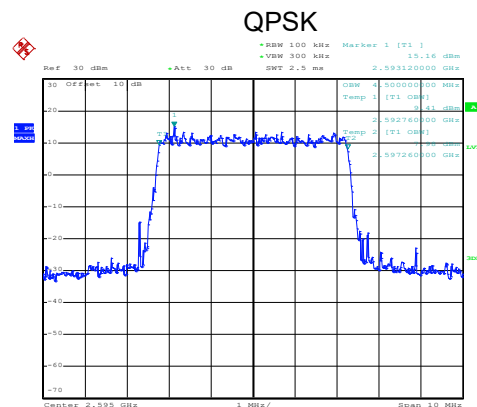


Date: 31.MAR.2021 16:45:43

Lowest channel

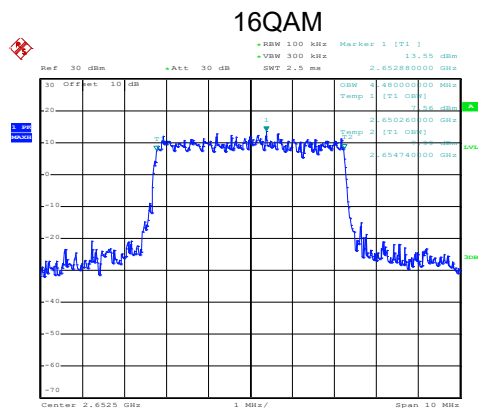


Date: 31.MAR.2021 16:46:28

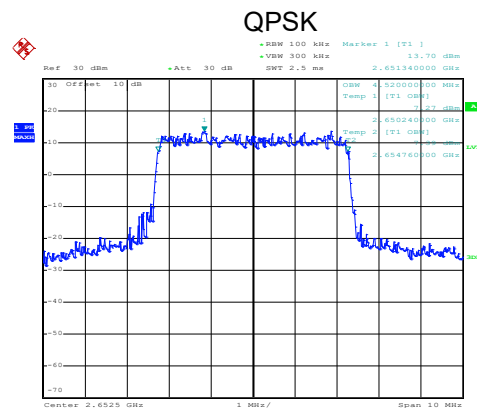


Date: 31.MAR.2021 16:46:24

Middle channel



Date: 31.MAR.2021 16:46:44

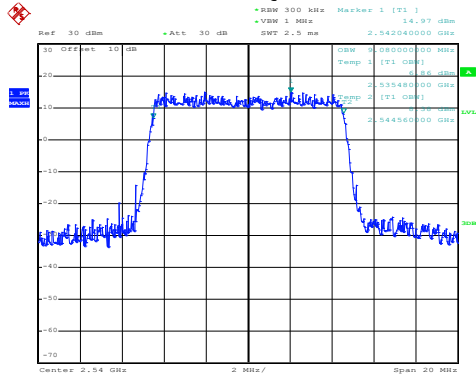


Date: 31.MAR.2021 16:46:40

Highest channel

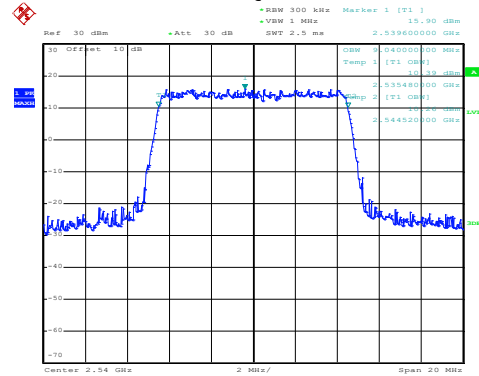
LTE Band 41: 99% Occupancy bandwidth
BW: 10MHz

16QAM



Date: 31.MAR.2021 16:48:42

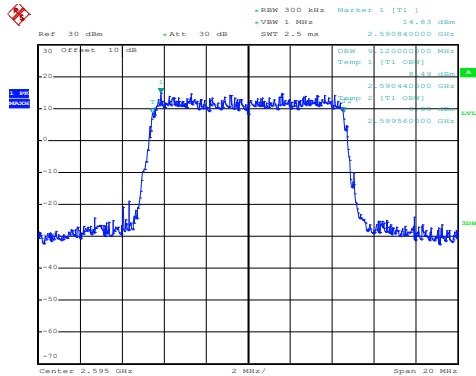
QPSK



Date: 31.MAR.2021 16:48:38

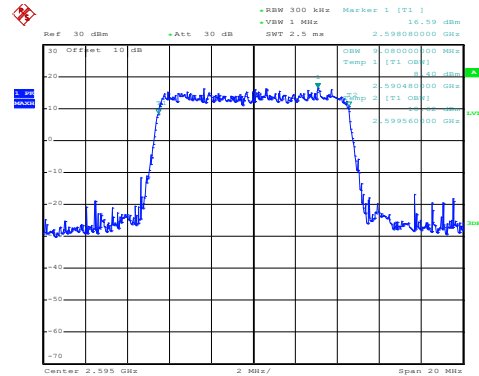
Lowest channel

16QAM



Date: 31.MAR.2021 16:48:07

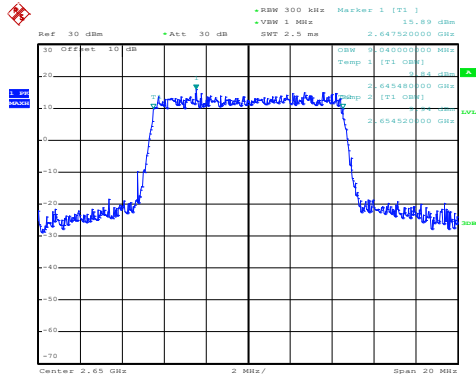
QPSK



Date: 31.MAR.2021 16:48:04

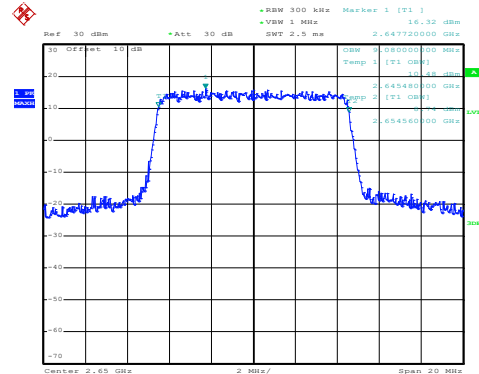
Middle channel

16QAM



Date: 31.MAR.2021 16:47:55

QPSK

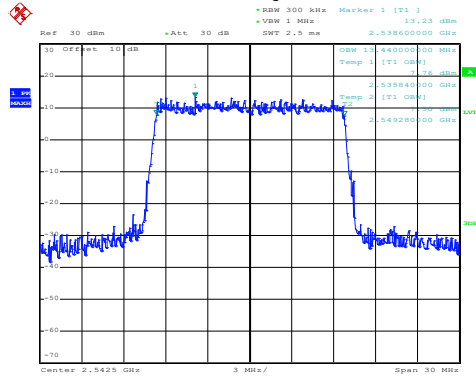


Date: 31.MAR.2021 16:47:51

Highest channel

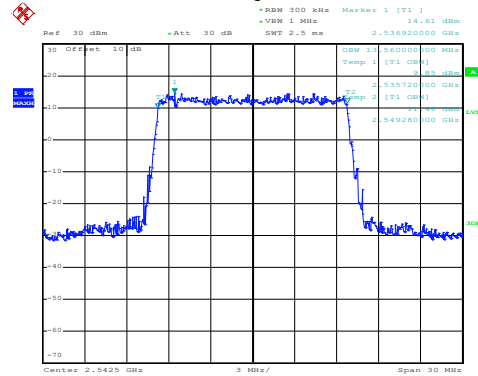
LTE Band 41: 99% Occupancy bandwidth
BW: 15MHz

16QAM



Date: 31.MAR.2021 16:49:25

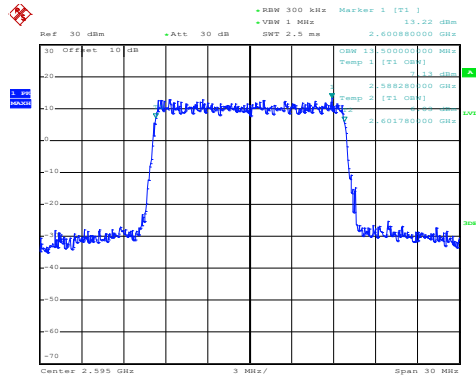
QPSK



Date: 31.MAR.2021 16:49:21

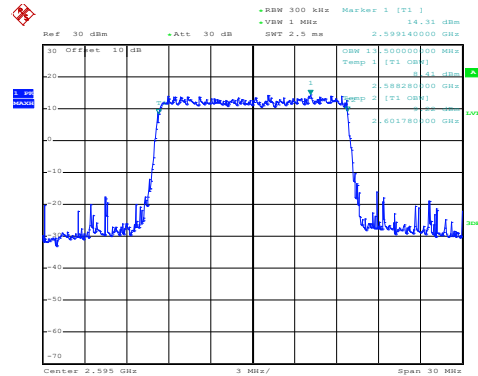
Lowest channel

16QAM



Date: 31.MAR.2021 16:50:00

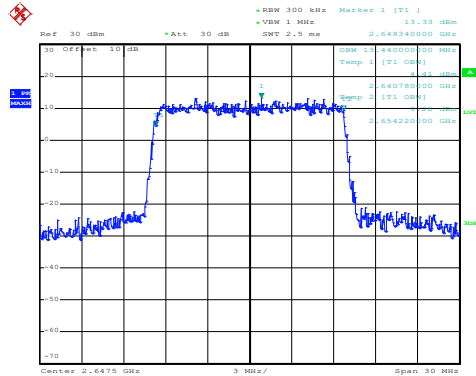
QPSK



Date: 31.MAR.2021 16:49:57

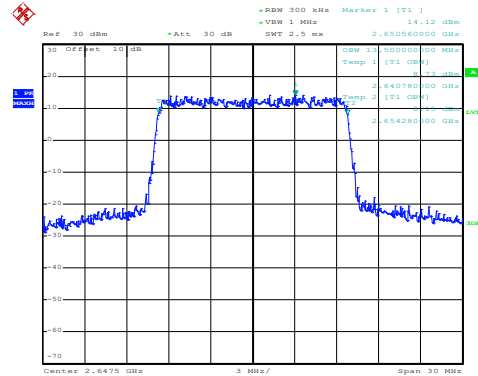
Middle channel

16QAM



Date: 31.MAR.2021 16:51:24

QPSK

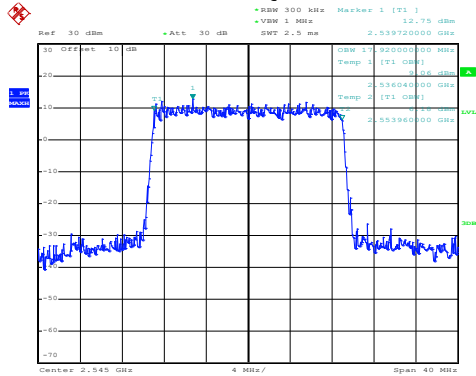


Date: 31.MAR.2021 16:51:20

Highest channel

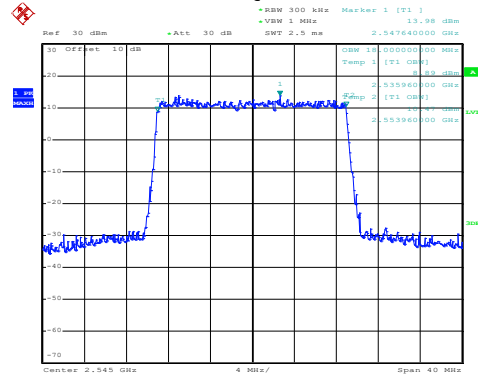
LTE Band 41: 99% Occupancy bandwidth
BW: 20MHz

16QAM



Date: 31.MAR.2021 16:52:52

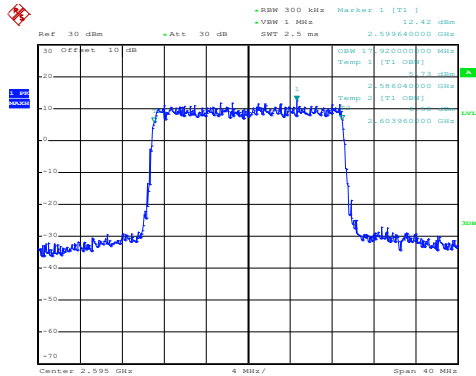
QPSK



Date: 31.MAR.2021 16:52:48

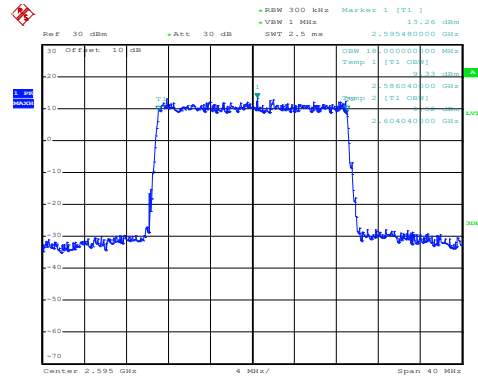
Lowest channel

16QAM



Date: 31.MAR.2021 16:52:15

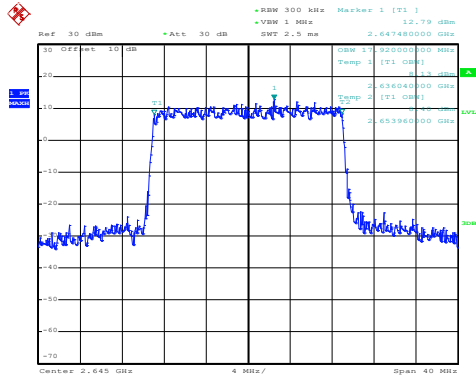
QPSK



Date: 31.MAR.2021 16:52:12

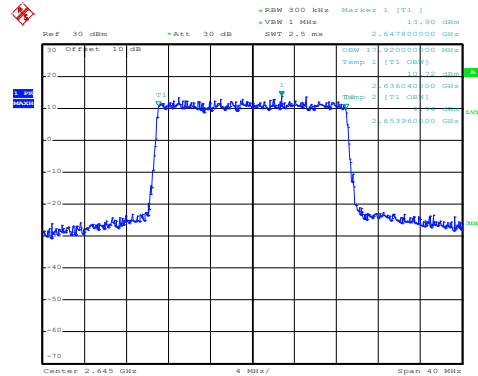
Middle channel

16QAM



Date: 31.MAR.2021 16:52:04

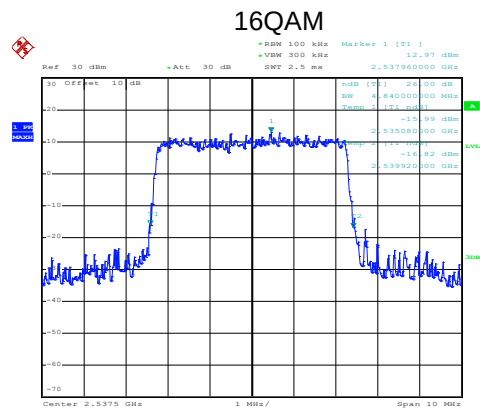
QPSK



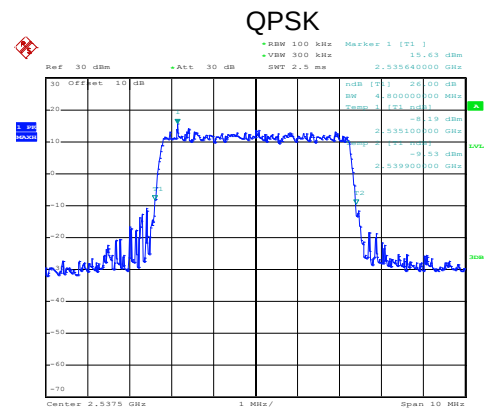
Date: 31.MAR.2021 16:52:00

Highest channel

LTE Band 41: -26dBc bandwidth
BW: 5MHz

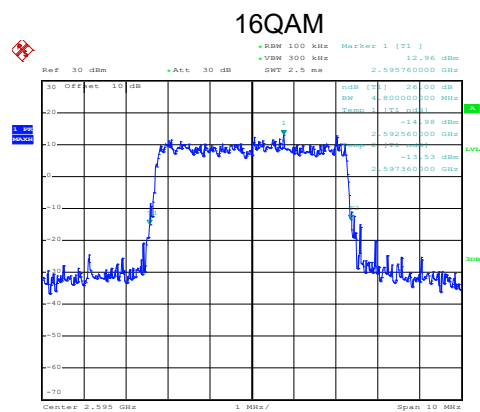


Date: 31.MAR.2021 16:46:00

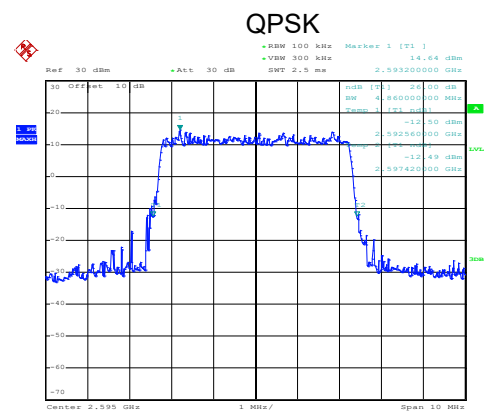


Date: 31.MAR.2021 16:45:55

Lowest channel

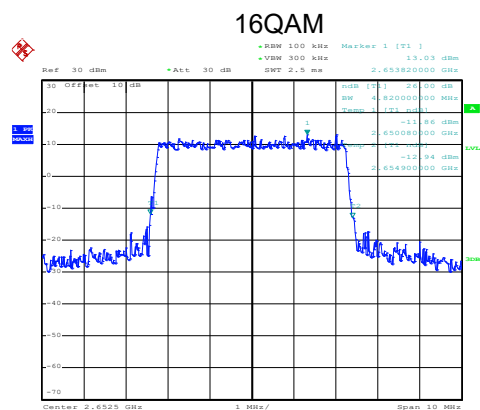


Date: 31.MAR.2021 16:46:18

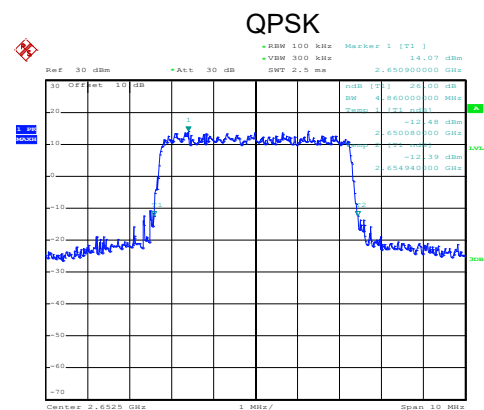


Date: 31.MAR.2021 16:46:14

Middle channel



Date: 31.MAR.2021 16:46:57

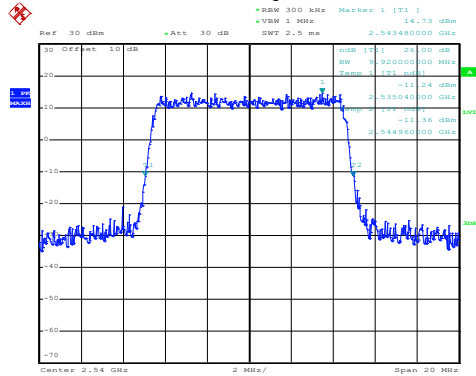


Date: 31.MAR.2021 16:46:52

Highest channel

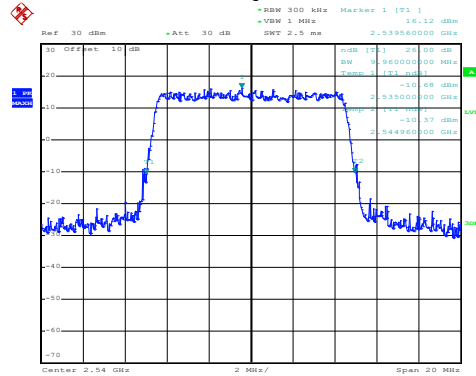
LTE Band 41: -26dBc bandwidth
BW: 10MHz

16QAM



Date: 31.MAR.2021 16:48:20

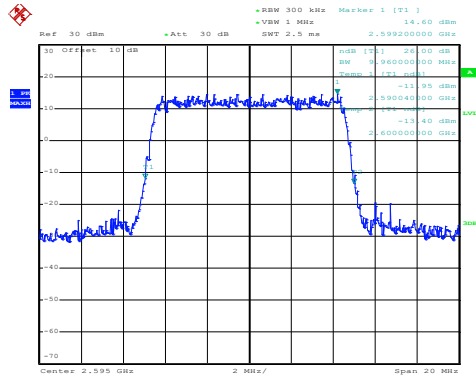
QPSK



Date: 31.MAR.2021 16:48:27

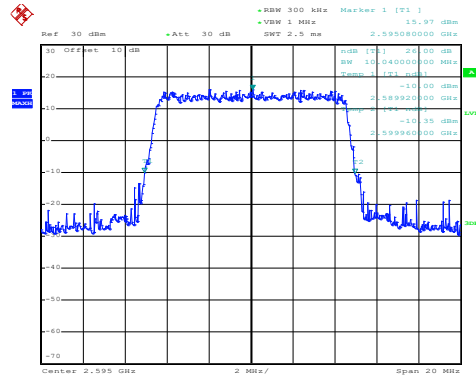
Lowest channel

16QAM



Date: 31.MAR.2021 16:48:17

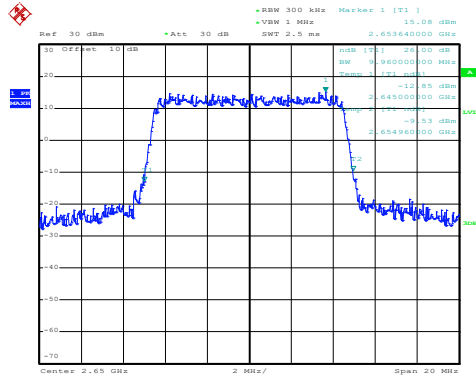
QPSK



Date: 31.MAR.2021 16:48:13

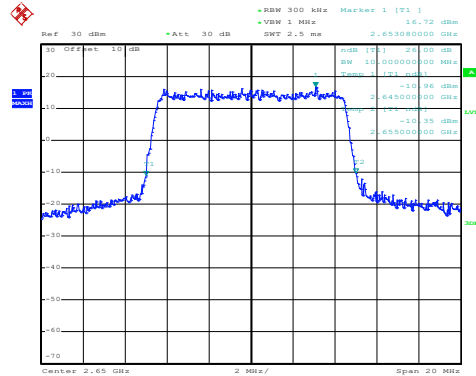
Middle channel

16QAM



Date: 31.MAR.2021 16:47:44

QPSK

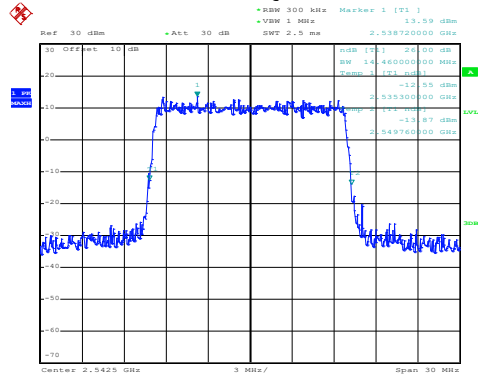


Date: 31.MAR.2021 16:47:40

Highest channel

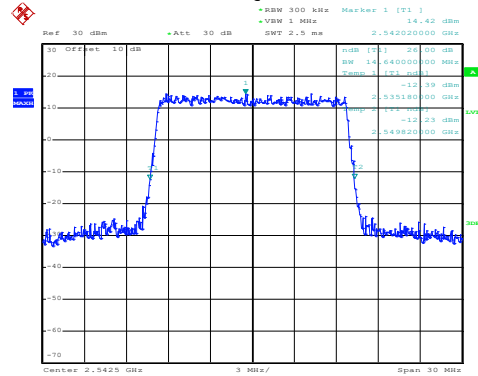
LTE Band 41: -26dBc bandwidth BW: 15MHz

16QAM



Date: 31.MAR.2021 16:49:36

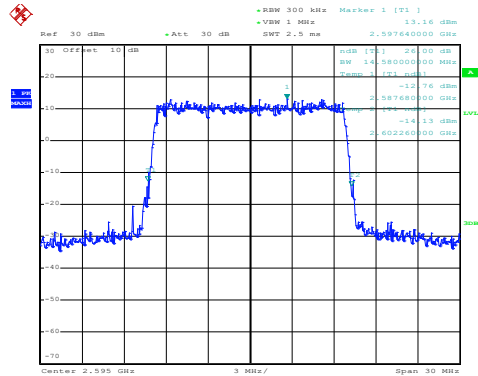
QPSK



Date: 31.MAR.2021 16:49:32

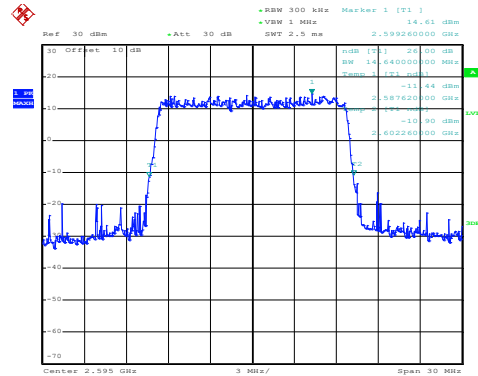
Lowest channel

16QAM



Date: 31.MAR.2021 16:49:50

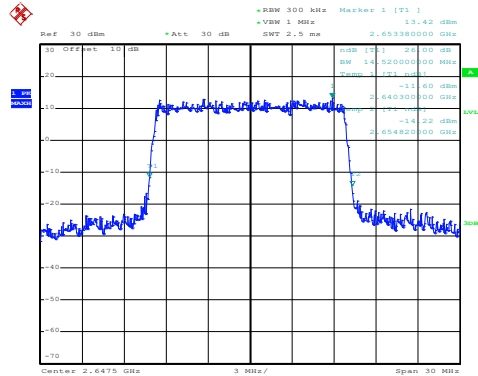
QPSK



Date: 31.MAR.2021 16:49:47

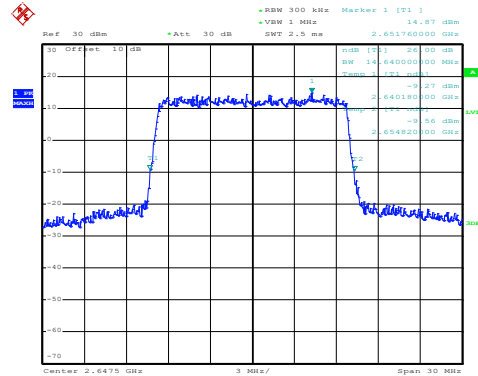
Middle channel

16QAM



Date: 31.MAR.2021 16:51:33

QPSK

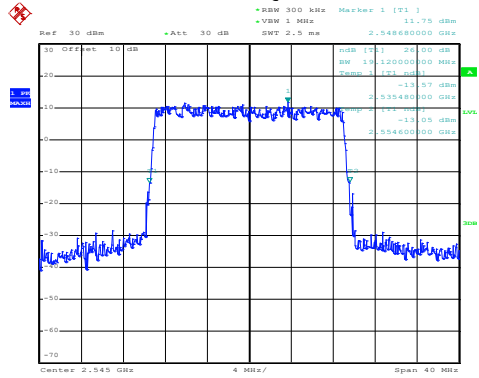


Date: 31.MAR.2021 16:51:30

Highest channel

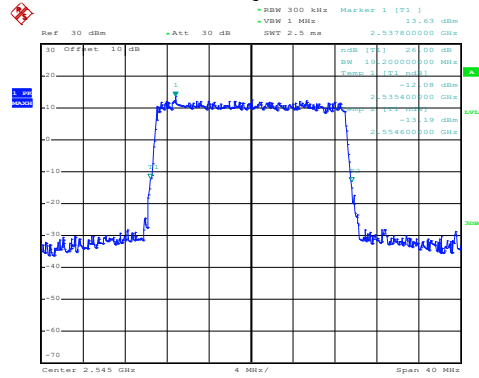
LTE Band 41: -26dBc bandwidth
BW: 20MHz

16QAM



Date: 31.MAR.2021 16:52:40

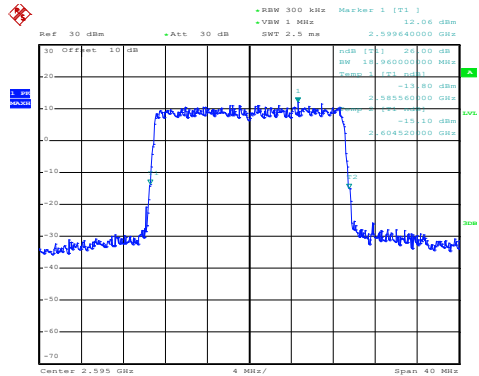
QPSK



Date: 31.MAR.2021 16:52:36

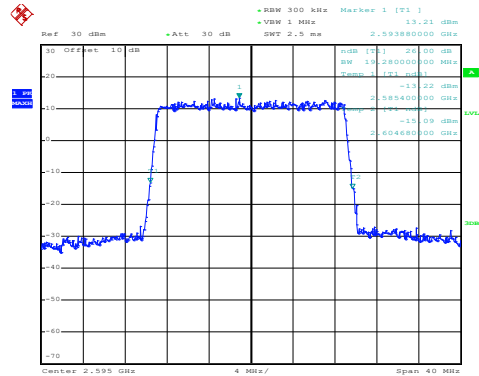
Lowest channel

16QAM



Date: 31.MAR.2021 16:52:25

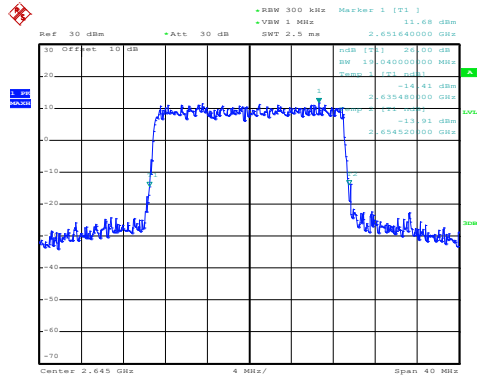
QPSK



Date: 31.MAR.2021 16:52:21

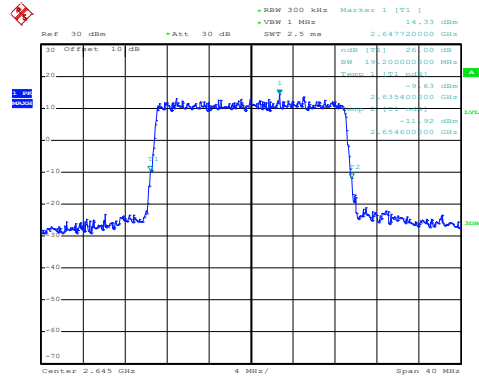
Middle channel

16QAM



Date: 31.MAR.2021 16:51:54

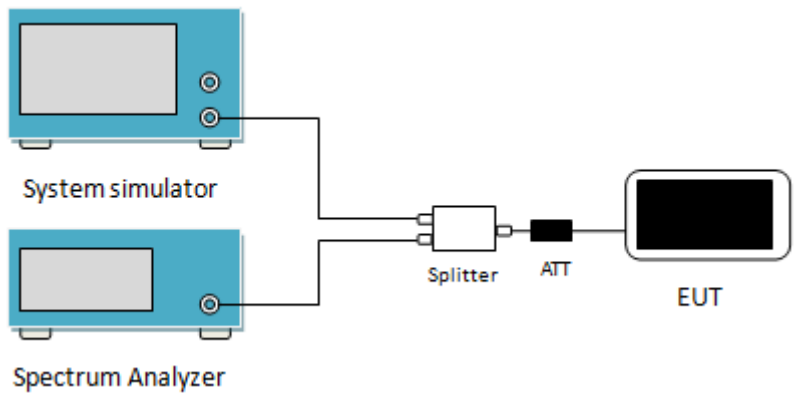
QPSK



Date: 31.MAR.2021 16:51:51

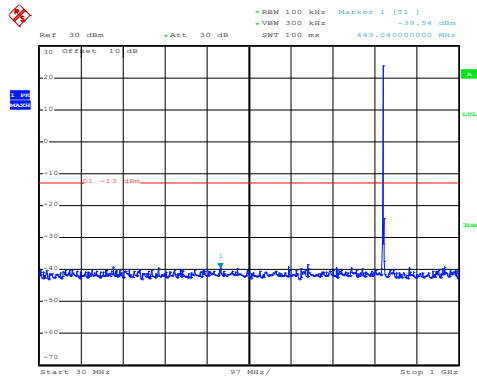
Highest channel

6.4 Out of band emission at antenna terminals

Test Requirement:	Part 22.917(a), Part 27.53(m)
Limit:	LTE Band 5: The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB (-13 dBm). LTE Band 41: For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log(P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log(P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log(P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log(P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log(P)$ dB at or below 2490.5 MHz.
Test Setup:	 The diagram illustrates the test setup. On the left, there are two blue rectangular units: the top one is labeled 'System simulator' and the bottom one is labeled 'Spectrum Analyzer'. Both have a single output port. These two ports are connected to a central 'Splitter' unit, which is a white rectangle with two input ports and one output port. The output of the Splitter is connected to a black rectangular unit labeled 'ATT' (Attenuator). Finally, the output of the ATT is connected to a white rectangular unit with a black screen, labeled 'EUT' (Equipment Under Test).
Test Procedure:	1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 2 For the out of band: For Band 5 set the RBW=100 kHz, VBW=300 kHz and for Band 41 set the RBW=1 MHz, VBW=3 MHz when below 1 GHz, RBW =1 MHz, VBW=3 MHz when above 1 GHz, Start=30MHz, Stop= 10th harmonic. 3 Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed
Remark:	Pre-scan all RB Size and offset, and found the RB Size and offset of worst case, so the report shows only the worst case test data.

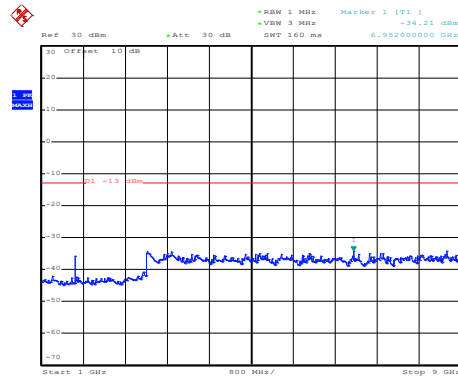
Test plots as follows (Conducted spurious emission) (worst case):
LTE Band 5 part:

LTE Band 5: 16 QAM & RB Size 1
BW: 1.4MHz
Lowest channel



Date: 31.MAR.2021 16:35:34

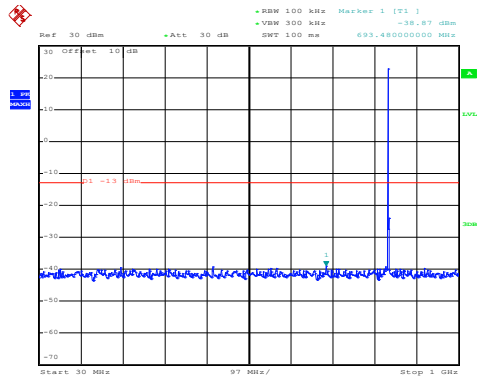
30MHz~1GHz



Date: 31.MAR.2021 16:36:59

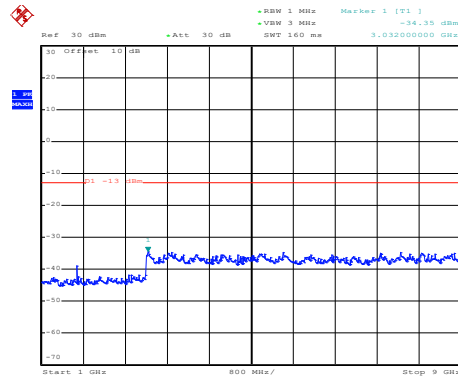
1GHz~9GHz

Middle channel



Date: 31.MAR.2021 16:35:53

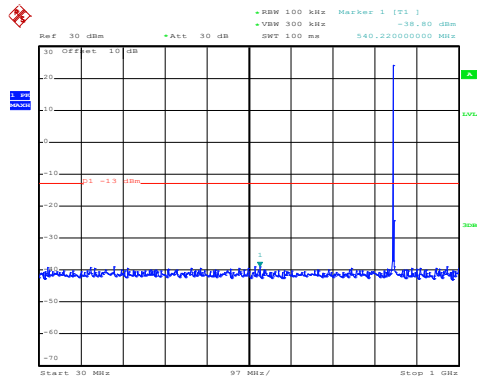
30MHz~1GHz



Date: 31.MAR.2021 16:36:43

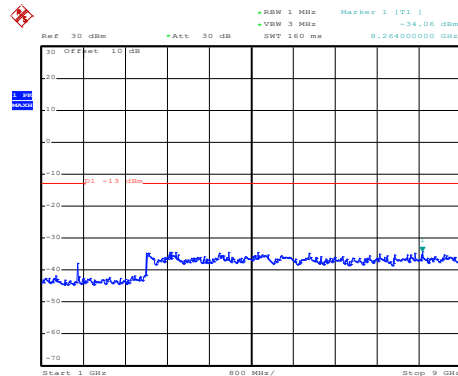
1GHz~9GHz

High channel



Date: 31.MAR.2021 16:36:14

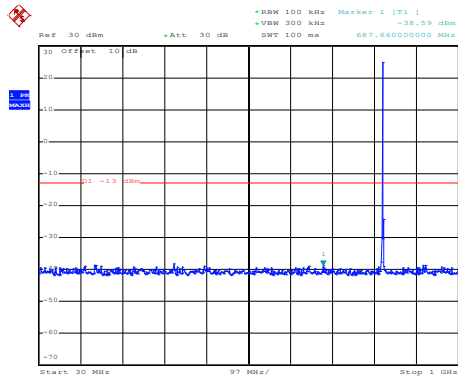
30MHz~1GHz



Date: 31.MAR.2021 16:36:32

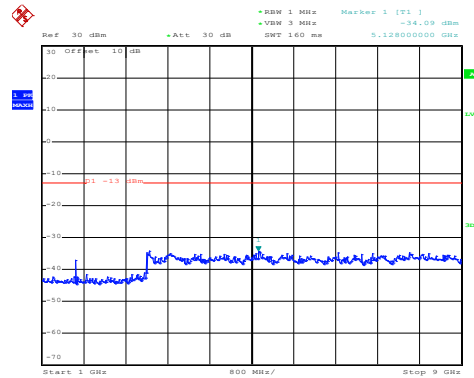
1GHz~9GHz

LTE Band 5: QPSK & RB Size 1 BW: 1.4MHz Lowest channel



Date: 31.MAR.2021 16:35:26

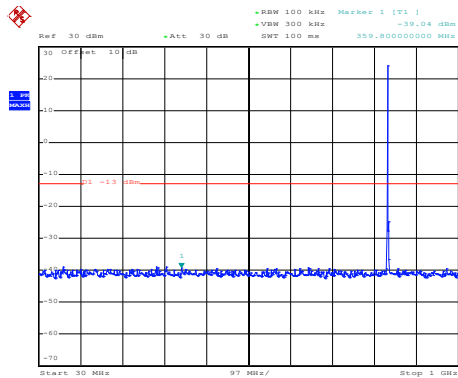
30MHz~1GHz



Date: 31.MAR.2021 16:36:54

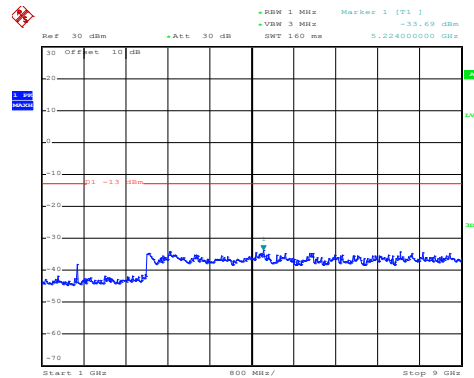
1GHz~9GHz

Middle channel



Date: 31.MAR.2021 16:35:47

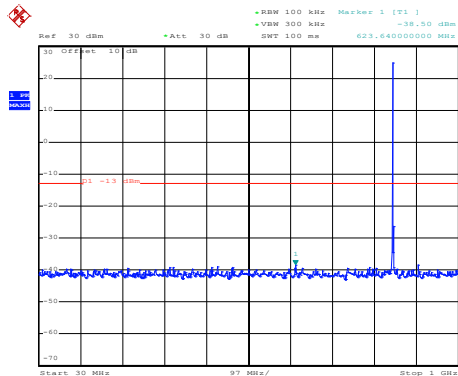
30MHz~1GHz



Date: 31.MAR.2021 16:36:39

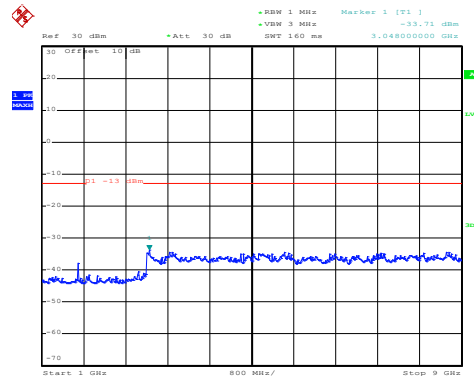
1GHz~9GHz

High channel



Date: 31.MAR.2021 16:36:05

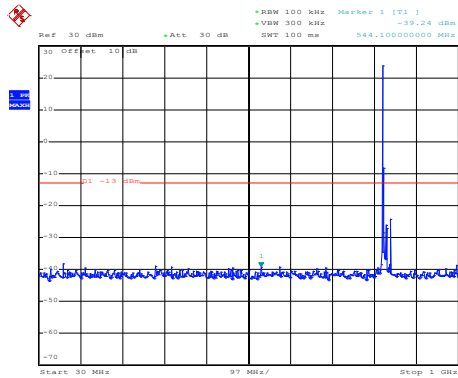
30MHz~1GHz



Date: 31.MAR.2021 16:36:26

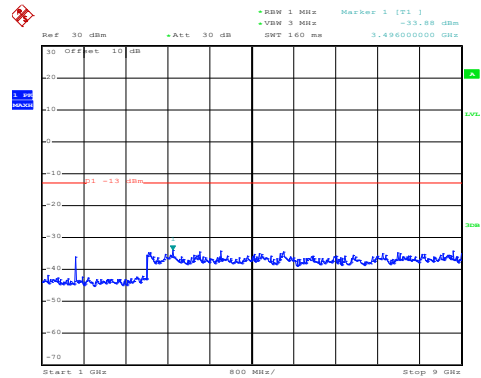
1GHz~9GHz

LTE Band 5: 16 QAM & RB Size 1
BW: 10MHz
Lowest channel



Date: 31.MAR.2021 16:38:53

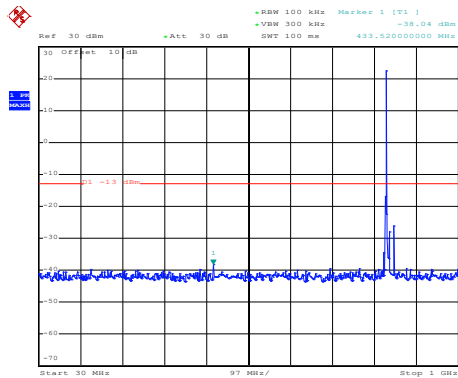
30MHz~1GHz



Date: 31.MAR.2021 16:37:23

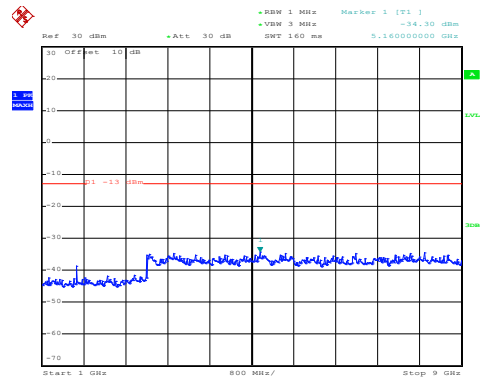
1GHz~9GHz

Middle channel



Date: 31.MAR.2021 16:38:34

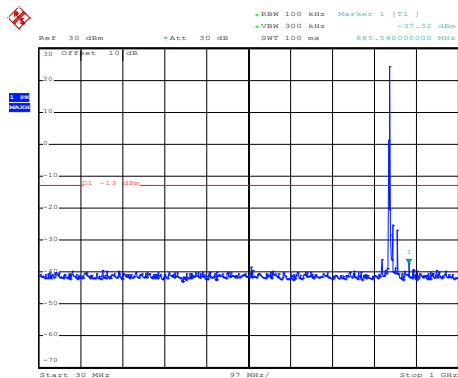
30MHz~1GHz



Date: 31.MAR.2021 16:37:36

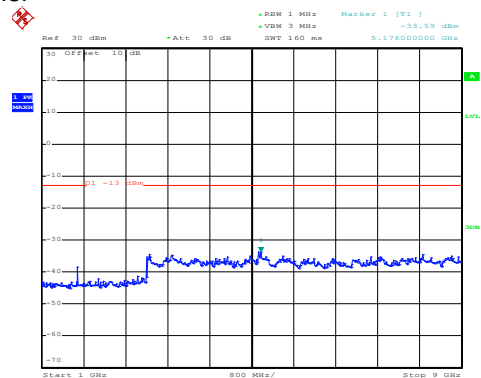
1GHz~9GHz

High channel



Date: 31.MAR.2021 16:38:19

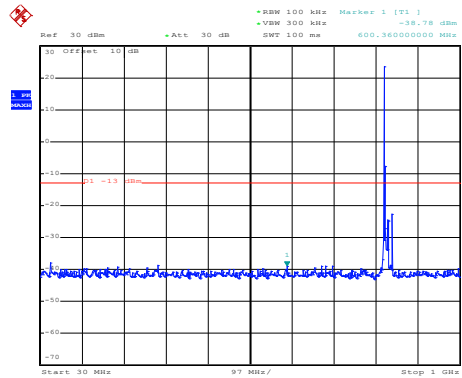
30MHz~1GHz



Date: 31.MAR.2021 16:37:49

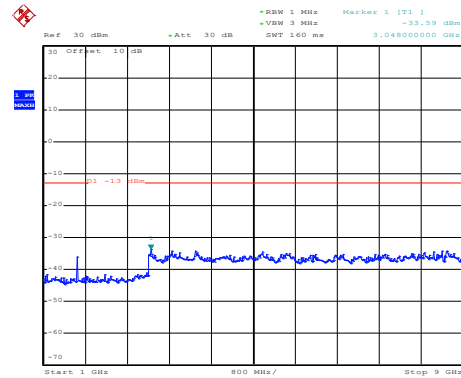
1GHz~9GHz

LTE Band 5: QPSK & RB Size 1
BW: 10MHz
Lowest channel



Date: 31.MAR.2021 16:38:47

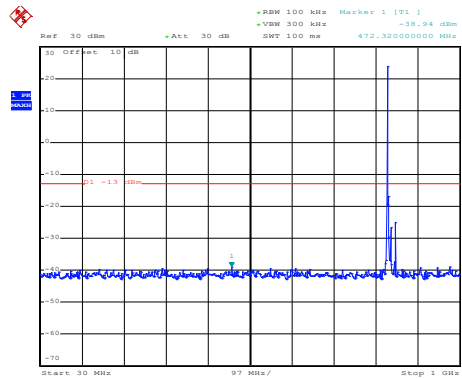
30MHz~1GHz



Date: 31.MAR.2021 16:37:19

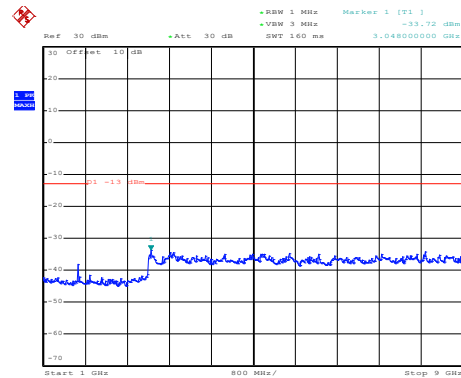
1GHz~9GHz

Middle channel



Date: 31.MAR.2021 16:38:29

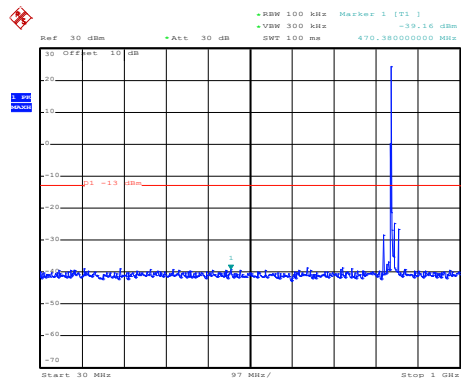
30MHz~1GHz



Date: 31.MAR.2021 16:37:31

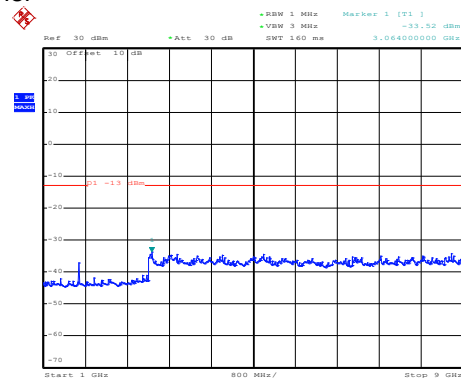
1GHz~9GHz

High channel



Date: 31.MAR.2021 16:38:10

30MHz~1GHz



Date: 31.MAR.2021 16:37:44

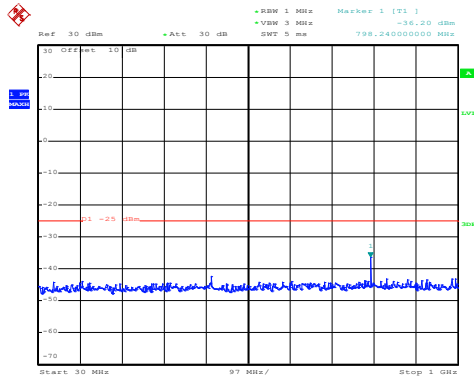
1GHz~9GHz

LTE Band 41 part:

LTE Band 41: 16 QAM & RB Size 1

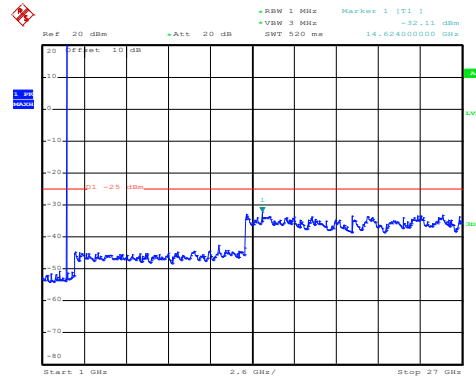
BW: 5MHz

Lowest channel



Date: 31.MAR.2021 16:34:45

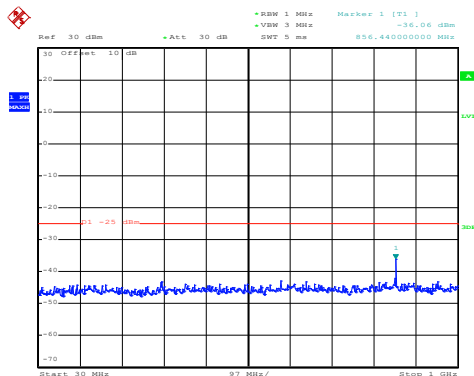
30MHz~1GHz



Date: 31.MAR.2021 16:33:15

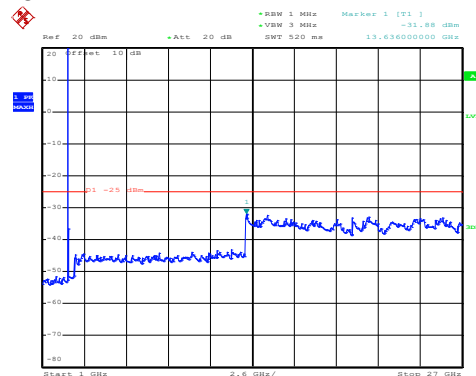
1GHz~27GHz

Middle channel



Date: 31.MAR.2021 16:34:32

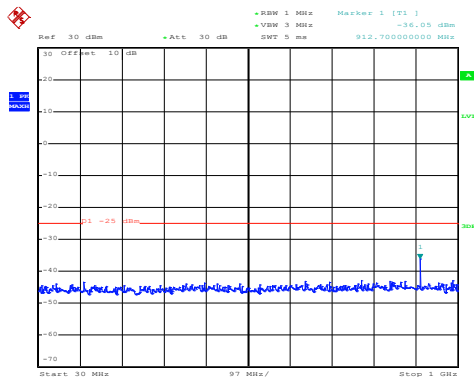
30MHz~1GHz



Date: 31.MAR.2021 16:33:33

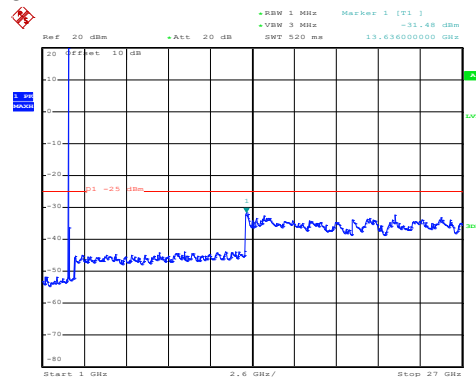
1GHz~27GHz

High channel



Date: 31.MAR.2021 16:34:18

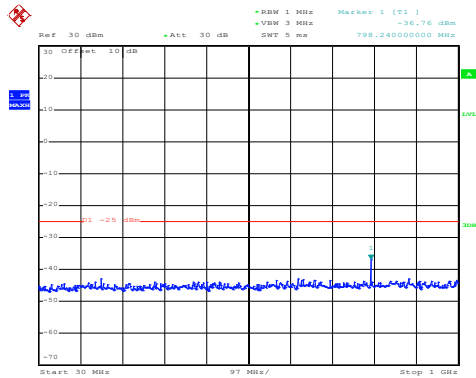
30MHz~1GHz



Date: 31.MAR.2021 16:33:56

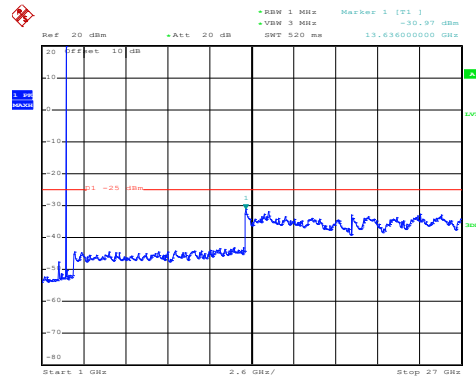
1GHz~27GHz

LTE Band 41: QPSK & RB Size 1
BW: 5MHz
Lowest channel



Date: 31.MAR.2021 16:34:41

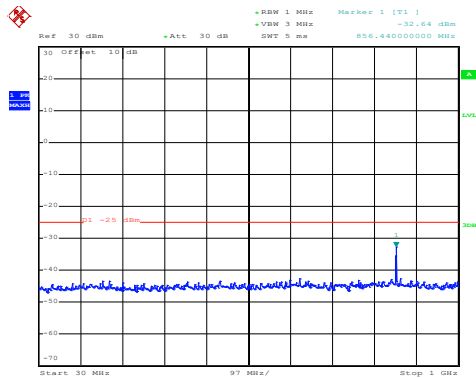
30MHz~1GHz



Date: 31.MAR.2021 16:33:09

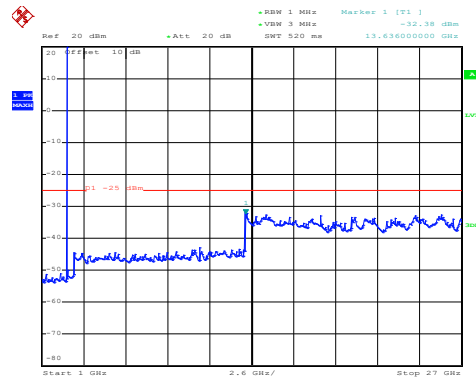
1GHz~27GHz

Middle channel



Date: 31.MAR.2021 16:34:27

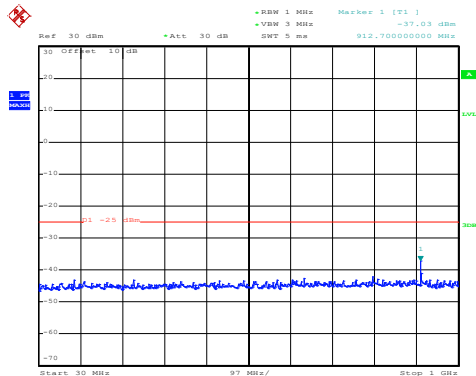
30MHz~1GHz



Date: 31.MAR.2021 16:33:25

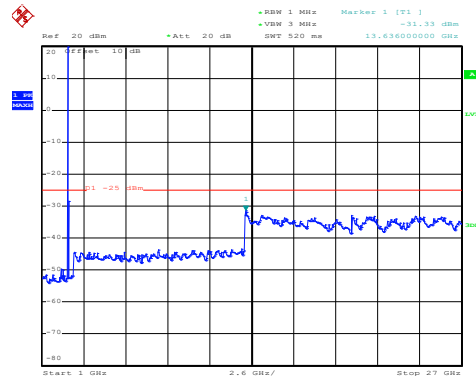
1GHz~27GHz

High channel



Date: 31.MAR.2021 16:34:12

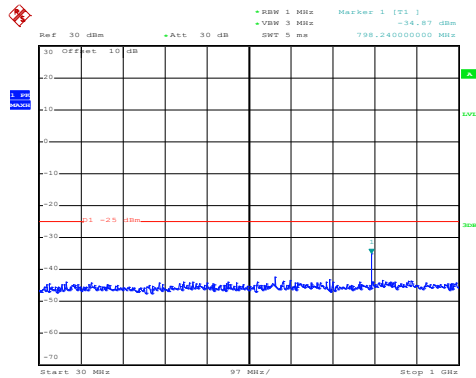
30MHz~1GHz



Date: 31.MAR.2021 16:33:50

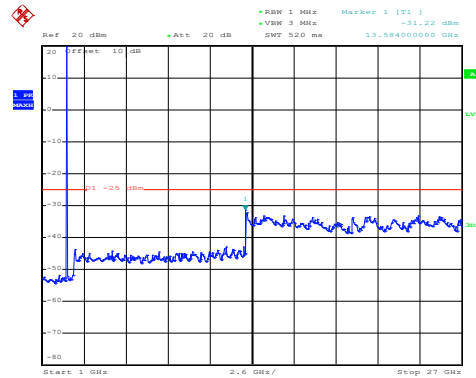
1GHz~27GHz

LTE Band 41: 16 QAM & RB Size 1
BW: 20MHz
Lowest channel



Date: 31.MAR.2021 16:31:24

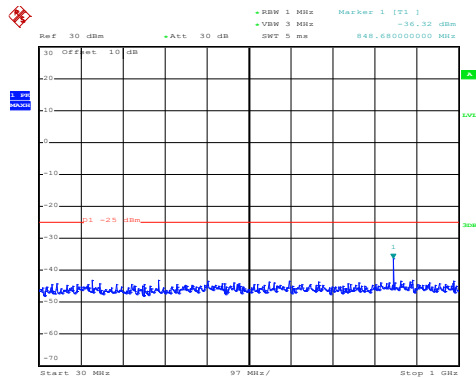
30MHz~1GHz



Date: 31.MAR.2021 16:31:51

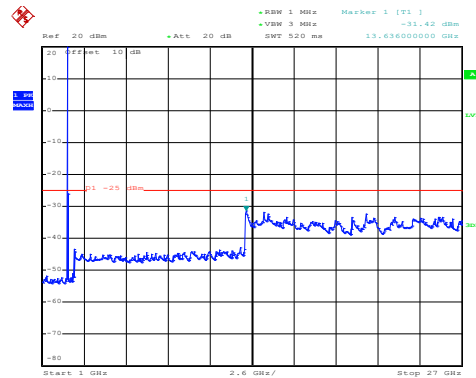
1GHz~27GHz

Middle channel



Date: 31.MAR.2021 16:31:10

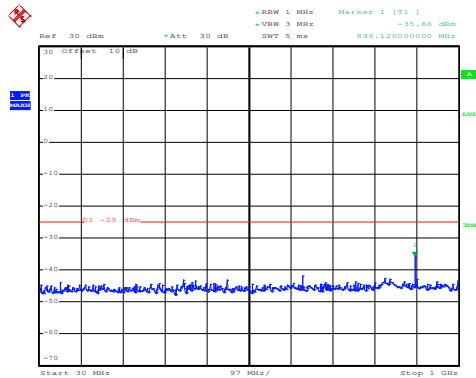
30MHz~1GHz



Date: 31.MAR.2021 16:32:11

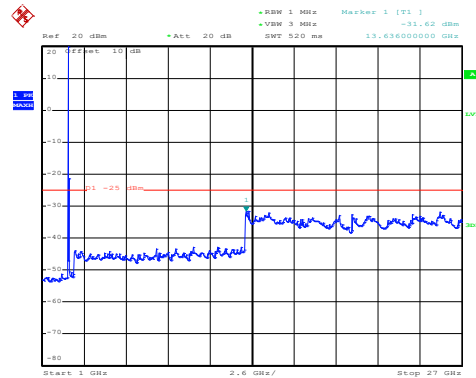
1GHz~27GHz

High channel



Date: 31.MAR.2021 16:30:53

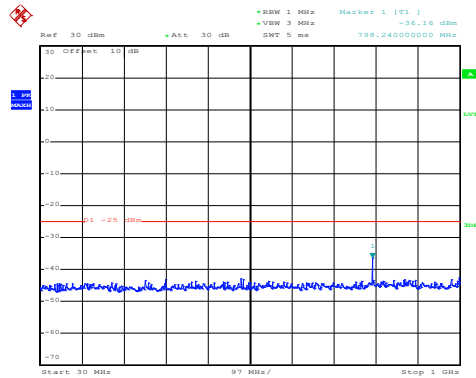
30MHz~1GHz



Date: 31.MAR.2021 16:32:49

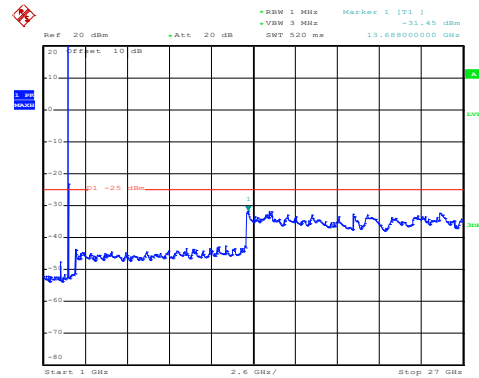
1GHz~27GHz

LTE Band 41: QPSK & RB Size 1
BW: 20MHz
Lowest channel



Date: 31.MAR.2021 16:31:19

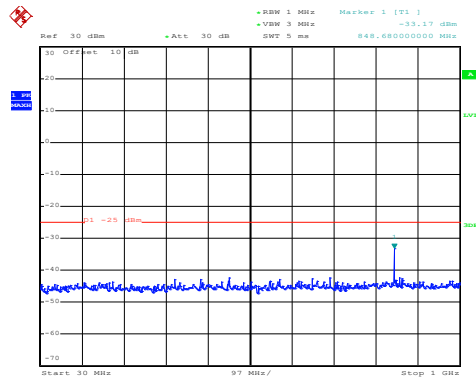
30MHz~1GHz



Date: 31.MAR.2021 16:31:46

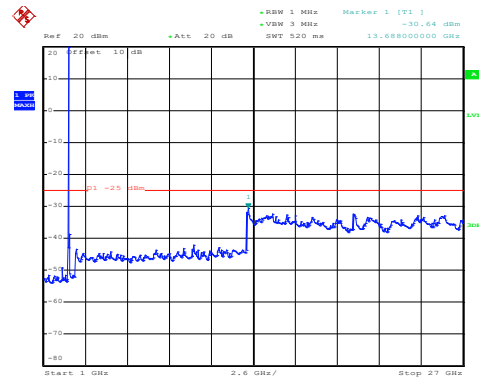
1GHz~27GHz

Middle channel



Date: 31.MAR.2021 16:31:06

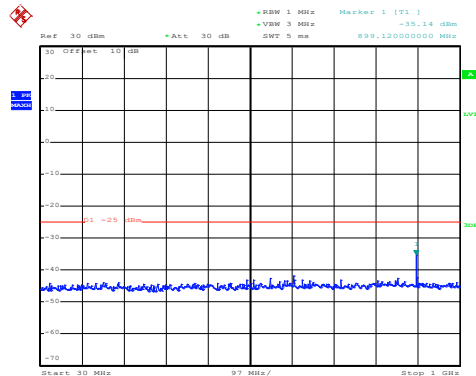
30MHz~1GHz



Date: 31.MAR.2021 16:32:05

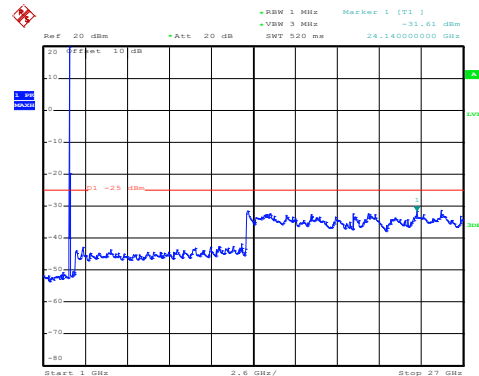
1GHz~27GHz

High channel



Date: 31.MAR.2021 16:30:48

30MHz~1GHz



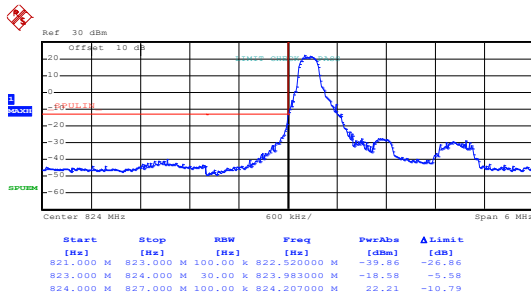
Date: 31.MAR.2021 16:32:37

1GHz~27GHz

Band edge emission:

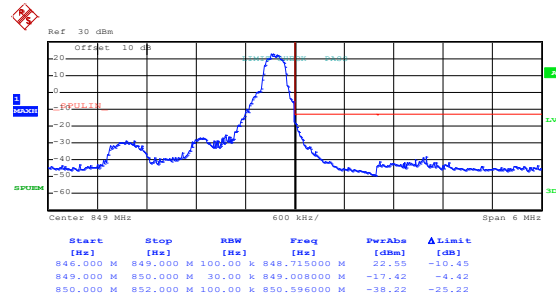
LTE Band 5 part:

**LTE Band 5, BW: 1.4MHz
16QAM & RB Size 1**



Date: 31.MAR.2021 16:20:11

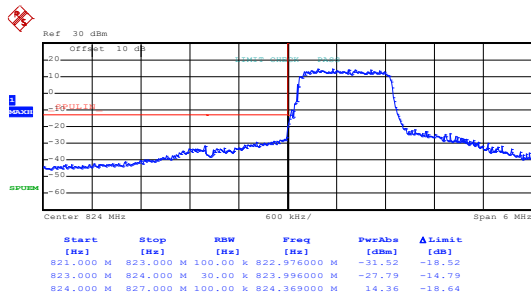
Lowest channel



Date: 31.MAR.2021 16:20:54

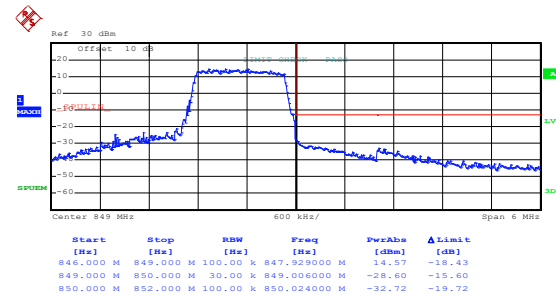
Highest channel

16QAM & RB Size 6



Date: 31.MAR.2021 16:20:21

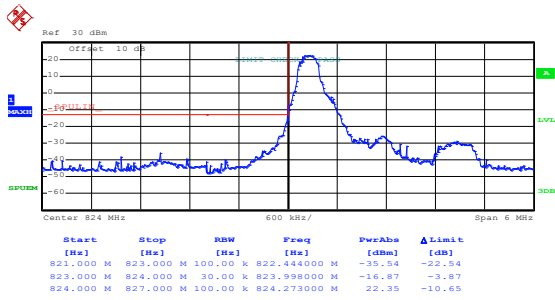
Lowest channel



Date: 31.MAR.2021 16:20:35

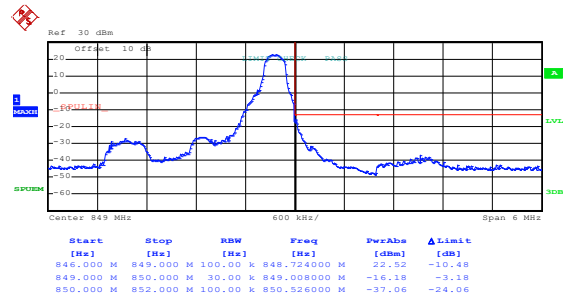
Highest channel

LTE Band 5, BW: 1.4MHz
QPSK & RB Size 1



Date: 31.MAR.2021 16:20:06

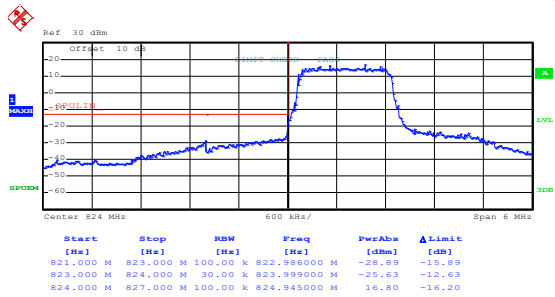
Lowest channel



Date: 31.MAR.2021 16:20:46

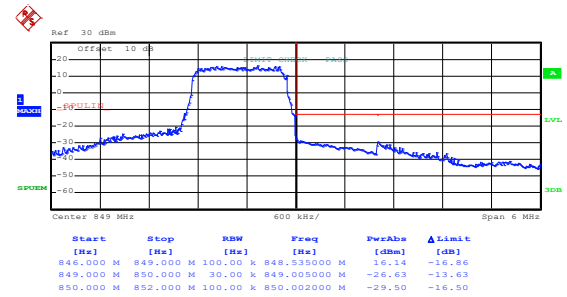
Highest channel

QPSK & RB Size 6



Date: 31.MAR.2021 16:20:17

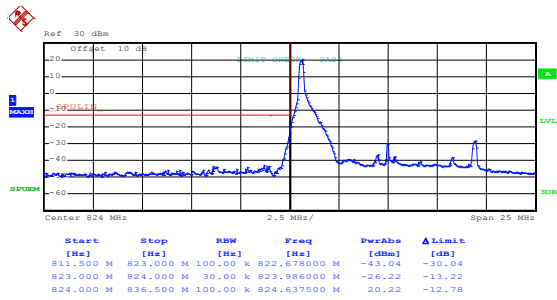
Lowest channel



Date: 31.MAR.2021 16:20:30

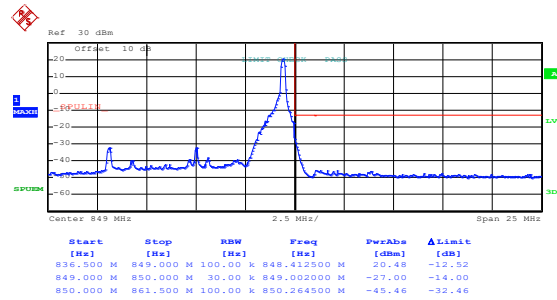
Highest channel

LTE Band 5, BW: 10MHz
16QAM & RB Size 1



Date: 31.MAR.2021 16:22:16

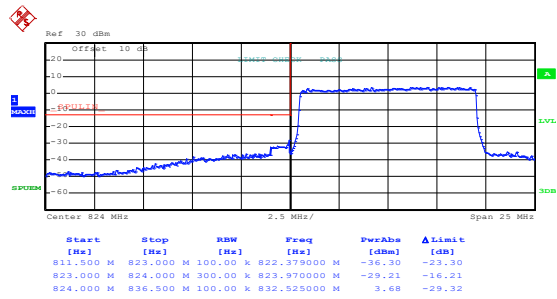
Lowest channel



Date: 31.MAR.2021 16:21:38

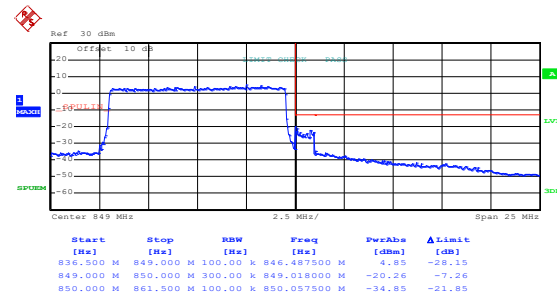
Highest channel

16QAM & RB Size 50



Date: 31.MAR.2021 16:22:31

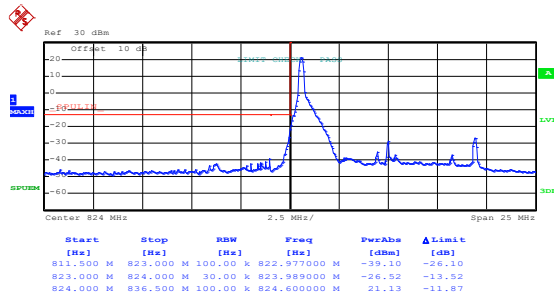
Lowest channel



Date: 31.MAR.2021 16:21:56

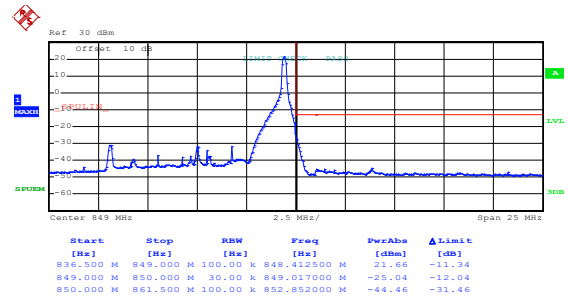
Highest channel

LTE Band 5, BW: 10MHz
QPSK & RB Size 1



Date: 31.MAR.2021 16:22:10

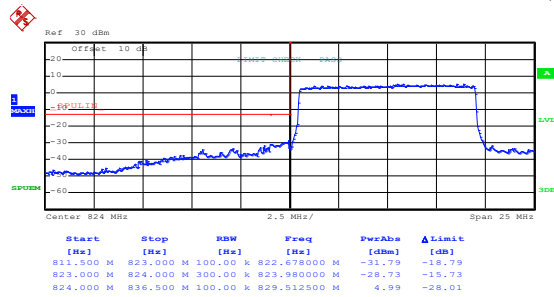
Lowest channel



Date: 31.MAR.2021 16:21:25

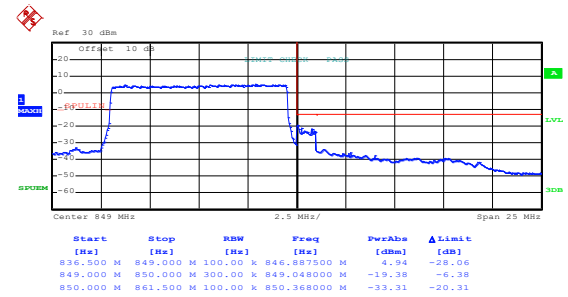
Highest channel

QPSK & RB Size 50



Date: 31.MAR.2021 16:22:27

Lowest channel

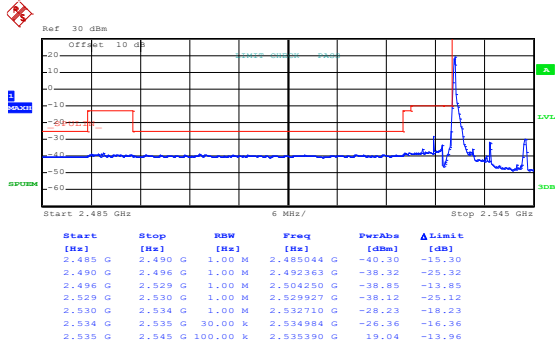


Date: 31.MAR.2021 16:21:52

Highest channel

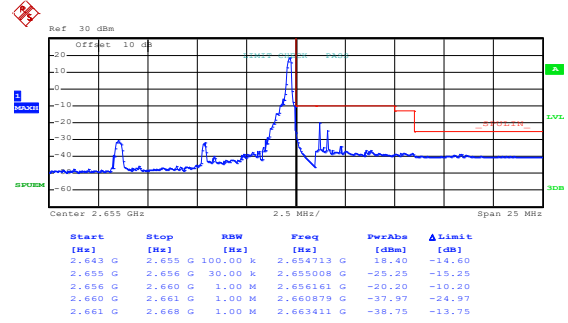
LTE Band 41 part:

LTE Band 41, BW: 5MHz 16QAM & RB Size 1



Date: 31.MAR.2021 16:24:05

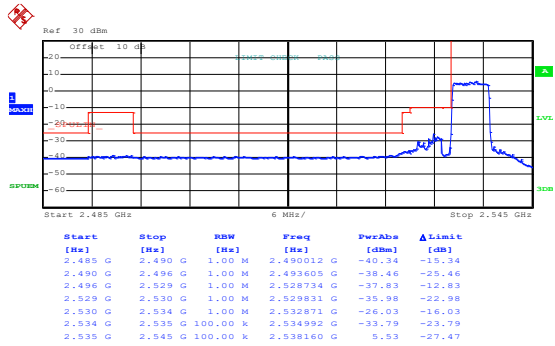
Lowest channel



Date: 31.MAR.2021 16:25:17

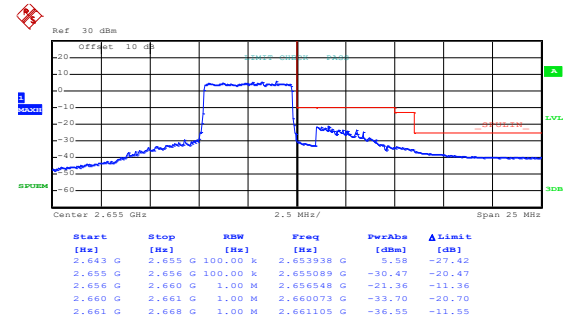
Highest channel

16QAM & RB Size 25



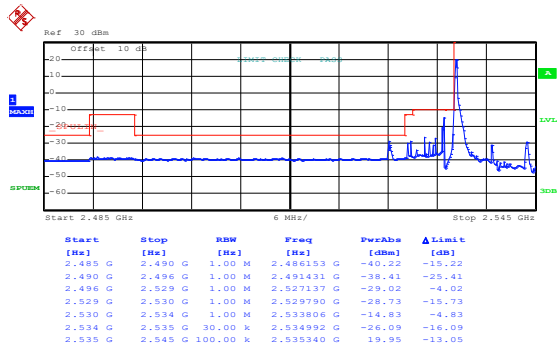
Date: 31.MAR.2021 16:24:26

Lowest channel



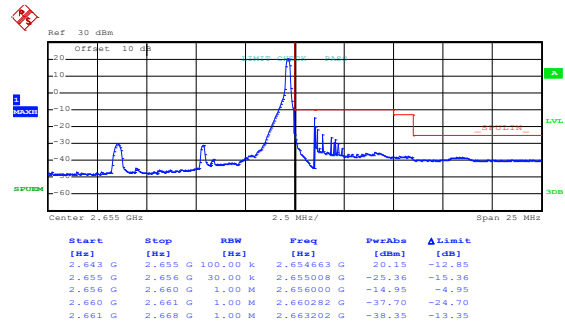
Date: 31.MAR.2021 16:25:44

Highest channel

LTE Band 41, BW: 5MHz
QPSK & RB Size 1

Date: 31.MAR.2021 16:23:55

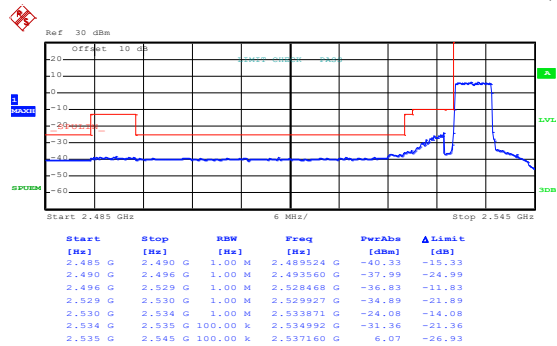
Lowest channel



Date: 31.MAR.2021 16:25:10

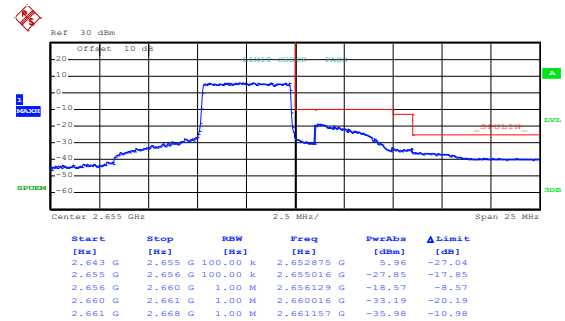
Highest channel

QPSK & RB Size 25



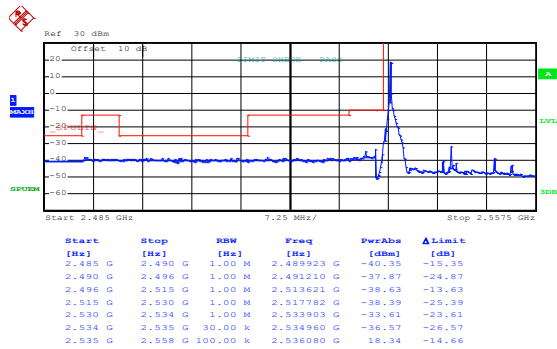
Date: 31.MAR.2021 16:24:20

Lowest channel



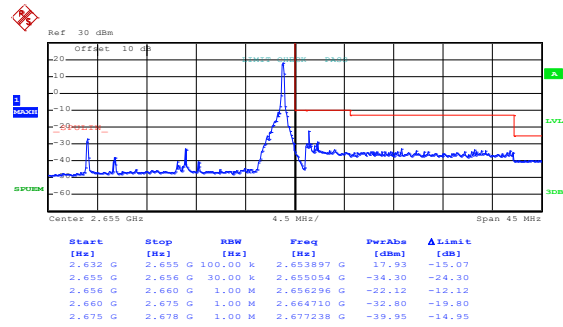
Date: 31.MAR.2021 16:25:37

Highest channel

LTE Band 41, BW: 20MHz
16QAM & RB Size 1

Date: 31.MAR.2021 16:26:40

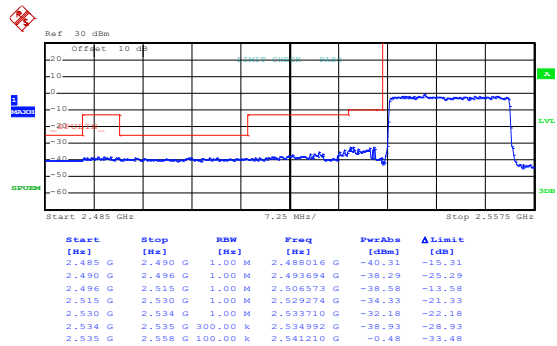
Lowest channel



Date: 31.MAR.2021 16:29:59

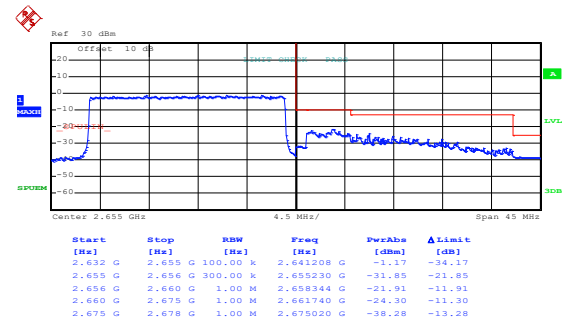
Highest channel

16QAM & RB Size 100



Date: 31.MAR.2021 16:27:00

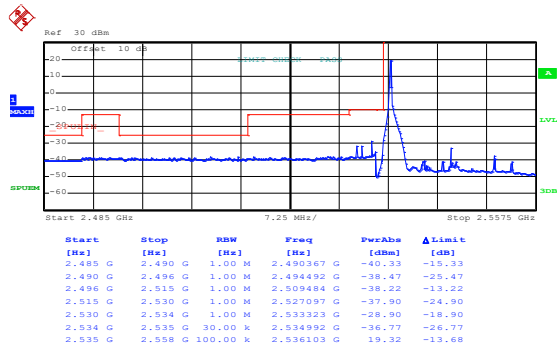
Lowest channel



Date: 31.MAR.2021 16:29:25

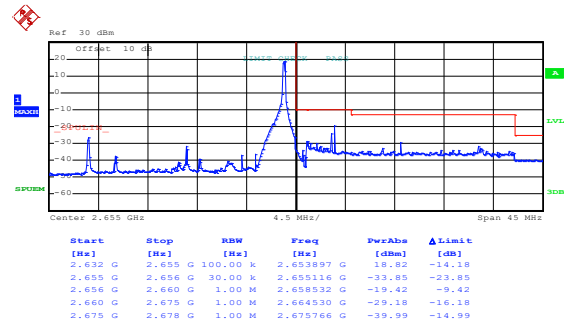
Highest channel

LTE Band 41, BW: 20MHz QPSK & RB Size 1



Date: 31.MAR.2021 16:26:34

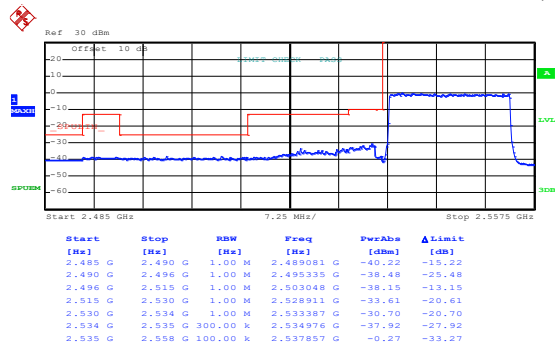
Lowest channel



Date: 31.MAR.2021 16:29:47

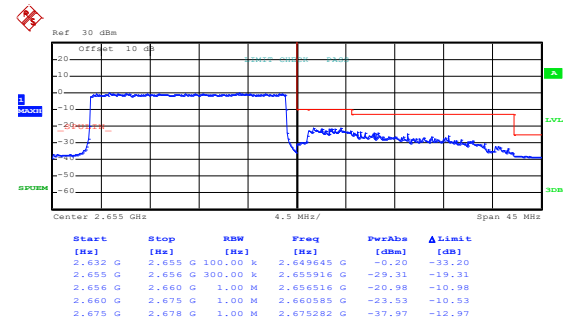
Highest channel

QPSK & RB Size 100



Date: 31.MAR.2021 16:26:54

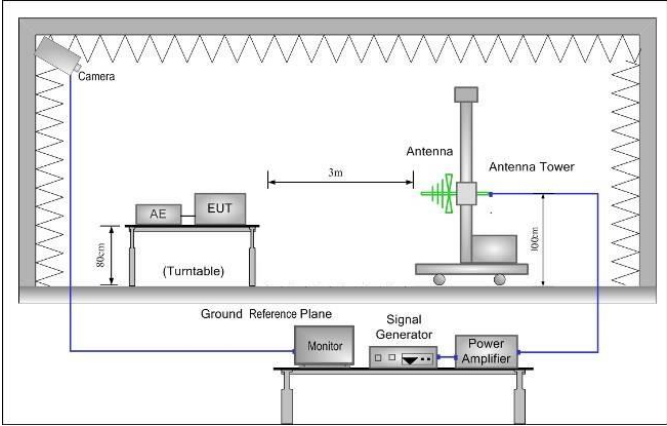
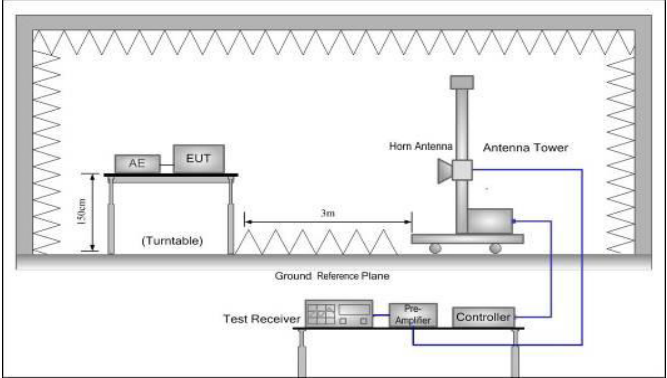
Lowest channel



Date: 31.MAR.2021 16:29:15

Highest channel

6.5 Field strength of spurious radiation measurement

Test Requirement:	Part 22.917(a), Part 27.53(h)
Limit:	LTE Band 5: The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB (-13 dBm). LTE Band 41: For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log(P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log(P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log(P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that $43 + 10 \log(P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log(P)$ dB at or below 2490.5 MHz.
Test setup:	Below 1GHz  Above 1GHz 
Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8m(below 1GHz)/1.5m(above 1GHz) above the ground at a 3 meter camber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. 2. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations. 3. The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method.

	4. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency. $\text{ERP / EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain(dB/dBi)} - \text{Cable Loss (dB)}$
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details.
Test results:	Passed

Measurement Data:

Band 5 (1.4MHz)							
Lowest channel							
Frequency (MHz)	Level at antenna terminals (dBm)	Substitute antenna gain (dBi)	Cable Loss (dBi)	Spurious Emission level (dBm)	Limit Line (dBm)	Over Limit (dBm)	Polarization
1649.40	-56.68	9.57	0.20	-47.31	-13.00	-34.31	Vertical
2474.10	-58.69	10.86	0.43	-48.26	-13.00	-35.26	Vertical
3298.80	-59.08	12.00	0.64	-47.72	-13.00	-34.72	Vertical
1649.40	-49.77	9.57	0.20	-40.40	-13.00	-27.40	Horizontal
2474.10	-59.56	10.86	0.43	-49.13	-13.00	-36.13	Horizontal
3298.80	-58.45	12.00	0.64	-47.09	-13.00	-34.09	Horizontal
Middle channel							
Frequency (MHz)	Level at antenna terminals (dBm)	Substitute antenna gain (dBi)	Cable Loss (dBi)	Spurious Emission level (dBm)	Limit Line (dBm)	Over Limit (dBm)	Polarization
1673.30	-56.77	9.66	0.22	-47.33	-13.00	-34.33	Vertical
2509.50	-58.35	10.91	0.46	-47.90	-13.00	-34.90	Vertical
3346.00	-58.87	12.09	0.66	-47.44	-13.00	-34.44	Vertical
1673.30	-49.90	9.66	0.22	-40.46	-13.00	-27.46	Horizontal
2509.50	-59.63	10.91	0.46	-49.18	-13.00	-36.18	Horizontal
3346.00	-58.89	12.09	0.66	-47.46	-13.00	-34.46	Horizontal
Highest channel							
Frequency (MHz)	Level at antenna terminals (dBm)	Substitute antenna gain (dBi)	Cable Loss (dBi)	Spurious Emission level (dBm)	Limit Line (dBm)	Over Limit (dBm)	Polarization
1696.60	-56.96	9.74	0.23	-47.45	-13.00	-34.45	Vertical
2544.90	-58.29	10.94	0.49	-47.84	-13.00	-34.84	Vertical
3393.20	-58.68	12.19	0.68	-47.17	-13.00	-34.17	Vertical
1696.60	-50.14	9.74	0.23	-40.63	-13.00	-27.63	Horizontal
2544.90	-59.37	10.94	0.49	-48.92	-13.00	-35.92	Horizontal
3393.20	-59.40	12.19	0.68	-47.89	-13.00	-34.89	Horizontal
Remark: The emission levels of below 1 GHz are lower than the limit 20dB and not show in test report.							

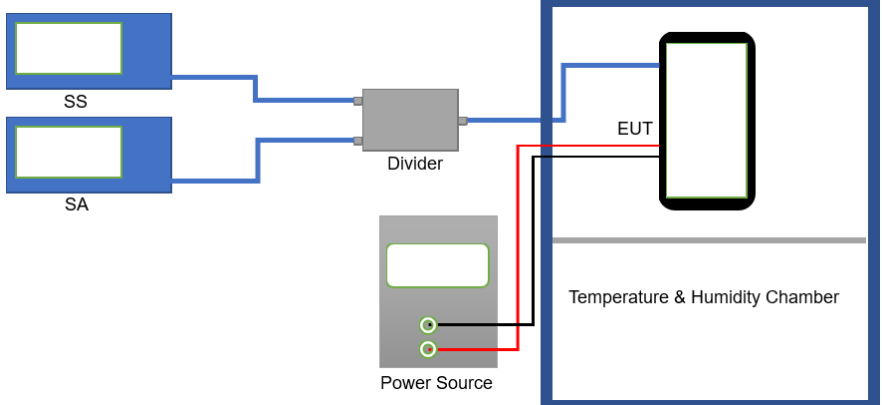
Band 5 (10MHz)							
Lowest channel							
Frequency (MHz)	Level at antenna terminals (dBm)	Substitute antenna gain (dBi)	Cable Loss (dBi)	Spurious Emission level (dBm)	Limit Line (dBm)	Over Limit (dBm)	Polarization
1658.00	-57.21	9.60	0.21	-47.82	-13.00	-34.82	Vertical
2487.00	-57.46	10.88	0.45	-47.03	-13.00	-34.03	Vertical
3316.00	-58.86	12.03	0.65	-47.48	-13.00	-34.48	Vertical
1658.00	-50.59	9.60	0.21	-41.20	-13.00	-28.20	Horizontal
2487.00	-58.92	10.88	0.45	-48.49	-13.00	-35.49	Horizontal
3316.00	-59.93	12.03	0.65	-48.55	-13.00	-35.55	Horizontal
Middle channel							
Frequency (MHz)	Level at antenna terminals (dBm)	Substitute antenna gain (dBi)	Cable Loss (dBi)	Spurious Emission level (dBm)	Limit Line (dBm)	Over Limit (dBm)	Polarization
1673.30	-57.27	9.66	0.21	-47.82	-13.00	-34.82	Vertical
2509.50	-57.93	10.91	0.46	-47.48	-13.00	-34.48	Vertical
3346.00	-58.69	12.09	0.66	-47.26	-13.00	-34.26	Vertical
1673.30	-50.39	9.66	0.21	-40.94	-13.00	-27.94	Horizontal
2509.50	-59.04	10.91	0.46	-48.59	-13.00	-35.59	Horizontal
3346.00	-59.72	12.09	0.66	-48.29	-13.00	-35.29	Horizontal
Highest channel							
Frequency (MHz)	Level at antenna terminals (dBm)	Substitute antenna gain (dBi)	Cable Loss (dBi)	Spurious Emission level (dBm)	Limit Line (dBm)	Over Limit (dBm)	Polarization
1688.00	-57.25	9.71	0.23	-47.77	-13.00	-34.77	Vertical
2532.00	-58.20	10.93	0.48	-47.75	-13.00	-34.75	Vertical
3376.00	-58.88	12.15	0.67	-47.40	-13.00	-34.40	Vertical
1688.00	-50.76	9.71	0.23	-41.28	-13.00	-28.28	Horizontal
2532.00	-58.83	10.93	0.48	-48.38	-13.00	-35.38	Horizontal
3376.00	-59.44	12.15	0.67	-47.96	-13.00	-34.96	Horizontal
Remark: The emission levels of below 1 GHz are lower than the limit 20dB and not show in test report.							

LTE Band 41 part:

Band 41 (5MHz)							
Lowest channel							
Frequency (MHz)	Level at antenna terminals (dBm)	Substitute antenna gain (dBi)	Cable Loss (dBi)	Spurious Emission level (dBm)	Limit Line (dBm)	Over Limit (dBm)	Polarization
5075.00	-49.75	13.00	0.94	-37.69	-25.00	-12.69	Vertical
7612.50	-45.58	11.50	1.65	-35.73	-25.00	-10.73	Vertical
10150.00	-43.99	11.70	1.91	-34.20	-25.00	-9.20	Vertical
5075.00	-52.42	13.00	0.94	-40.36	-25.00	-15.36	Horizontal
7612.50	-45.06	11.50	1.65	-35.21	-25.00	-10.21	Horizontal
10150.00	-47.47	11.70	1.91	-37.68	-25.00	-12.68	Horizontal
Middle channel							
Frequency (MHz)	Level at antenna terminals (dBm)	Substitute antenna gain (dBi)	Cable Loss (dBi)	Spurious Emission level (dBm)	Limit Line (dBm)	Over Limit (dBm)	Polarization
5190.00	-49.30	12.89	1.04	-37.45	-25.00	-12.45	Vertical
7785.00	-45.05	11.17	1.73	-35.61	-25.00	-10.61	Vertical
10380.00	-43.76	11.48	1.97	-34.25	-25.00	-9.25	Vertical
5190.00	-52.10	12.89	1.04	-40.25	-25.00	-15.25	Horizontal
7785.00	-44.87	11.17	1.73	-35.43	-25.00	-10.43	Horizontal
10380.00	-46.69	11.48	1.97	-37.18	-25.00	-12.18	Horizontal
Highest channel							
Frequency (MHz)	Level at antenna terminals (dBm)	Substitute antenna gain (dBi)	Cable Loss (dBi)	Spurious Emission level (dBm)	Limit Line (dBm)	Over Limit (dBm)	Polarization
5305.00	-49.09	12.78	1.11	-37.42	-25.00	-12.42	Vertical
7957.50	-45.17	10.92	1.82	-36.07	-25.00	-11.07	Vertical
10610.00	-43.92	11.25	2.00	-34.67	-25.00	-9.67	Vertical
5305.00	-51.99	12.78	1.11	-40.32	-25.00	-15.32	Horizontal
7957.50	-44.06	10.92	1.82	-34.96	-25.00	-9.96	Horizontal
10610.00	-46.56	11.25	2.00	-37.31	-25.00	-12.31	Horizontal
Remark: The emission levels of below 1 GHz are lower than the limit 20dB and not show in test report.							

Band 41 (20MHz)							
Lowest channel							
Frequency (MHz)	Level at antenna terminals (dBm)	Substitute antenna gain (dBi)	Cable Loss (dBi)	Spurious Emission level (dBm)	Limit Line (dBm)	Over Limit (dBm)	Polarization
5090.00	-49.69	12.99	0.95	-37.65	-25.00	-12.65	Vertical
7635.00	-45.49	11.48	1.66	-35.67	-25.00	-10.67	Vertical
10180.00	-44.27	11.69	1.92	-34.50	-25.00	-9.50	Vertical
5090.00	-52.48	12.99	0.95	-40.44	-25.00	-15.44	Horizontal
7635.00	-44.86	11.48	1.66	-35.04	-25.00	-10.04	Horizontal
10180.00	-47.37	11.69	1.92	-37.60	-25.00	-12.60	Horizontal
Middle channel							
Frequency (MHz)	Level at antenna terminals (dBm)	Substitute antenna gain (dBi)	Cable Loss (dBi)	Spurious Emission level (dBm)	Limit Line (dBm)	Over Limit (dBm)	Polarization
5190.00	-49.48	12.89	1.04	-37.63	-25.00	-12.63	Vertical
7785.00	-45.24	11.17	1.73	-35.80	-25.00	-10.80	Vertical
10380.00	-43.93	11.48	1.97	-34.42	-25.00	-9.42	Vertical
5190.00	-52.23	12.89	1.04	-40.38	-25.00	-15.38	Horizontal
7785.00	-44.95	11.17	1.73	-35.51	-25.00	-10.51	Horizontal
10380.00	-47.17	11.48	1.97	-37.66	-25.00	-12.66	Horizontal
Highest channel							
Frequency (MHz)	Level at antenna terminals (dBm)	Substitute antenna gain (dBi)	Cable Loss (dBi)	Spurious Emission level (dBm)	Limit Line (dBm)	Over Limit (dBm)	Polarization
5290.00	-48.92	12.78	1.10	-37.24	-25.00	-12.24	Vertical
7935.00	-45.36	10.91	1.79	-36.24	-25.00	-11.24	Vertical
10580.00	-44.01	11.27	1.99	-34.73	-25.00	-9.73	Vertical
5290.00	-52.28	12.78	1.10	-40.60	-25.00	-15.60	Horizontal
7935.00	-44.31	10.91	1.79	-35.19	-25.00	-10.19	Horizontal
10580.00	-47.40	11.27	1.99	-38.12	-25.00	-13.12	Horizontal
Remark: The emission levels of below 1 GHz are lower than the limit 20dB and not show in test report.							

6.6 Frequency stability V.S. Temperature measurement

Test Requirement:	Part 22.355, Part 27.54, Part 2.1055(a)(1)(b)
Limit:	±2.5 ppm for Band 5 Within authorized band for Band 41
Test setup:	
Test procedure:	1. The equipment under test was connected to an external DC power supply and input rated voltage. 2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. 3. The EUT was placed inside the temperature chamber. 4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. 5. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. 6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

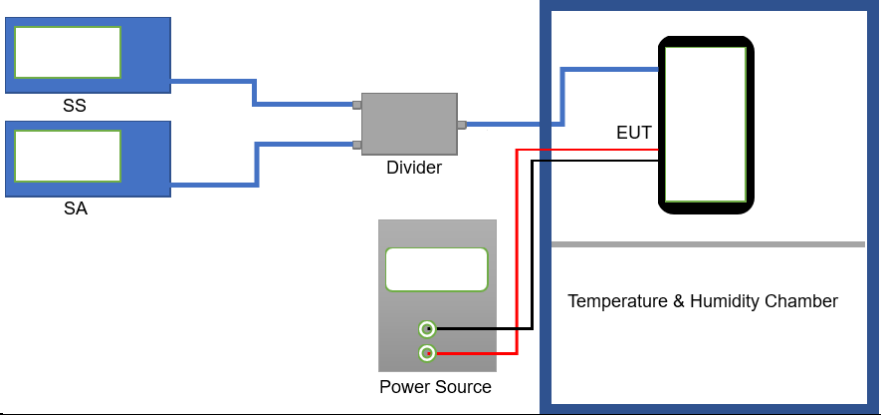
Measurement Data (worst case):
LTE Band 5 part:

Reference Frequency: LTE Band 5 (10MHz) Middle channel=20525 channel=836.50MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.60	-30	198	0.236701	±2.5	Pass
	-20	181	0.216378		
	-10	123	0.147041		
	0	165	0.197250		
	10	177	0.211596		
	20	148	0.176928		
	30	100	0.119546		
	40	121	0.144650		
	50	134	0.160191		
16QAM					
3.60	-30	199	0.237896	±2.5	Pass
	-20	123	0.147041		
	-10	165	0.197250		
	0	178	0.212791		
	10	180	0.215182		
	20	138	0.164973		
	30	114	0.136282		
	40	148	0.176928		
	50	107	0.127914		
Note: Only the worst case shown in the report.					

LTE Band 41 part:

Reference Frequency: LTE Band 41 (10MHz) Middle channel=40640 Frequency=2595.00MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.60	-30	195	0.075145	Within authorized band for Band 41	Pass
	-20	151	0.058189		
	-10	180	0.069364		
	0	177	0.068208		
	10	164	0.063198		
	20	140	0.053950		
	30	130	0.050096		
	40	144	0.055491		
	50	107	0.041233		
16QAM					
3.60	-30	196	0.075530	Within authorized band for Band 41	Pass
	-20	188	0.072447		
	-10	170	0.065511		
	0	130	0.050096		
	10	164	0.063198		
	20	144	0.055491		
	30	150	0.057803		
	40	111	0.042775		
	50	109	0.042004		
Note: Only the worst case shown in the report.					

6.7 Frequency stability V.S. Voltage measurement

Test Requirement:	Part 22.355, Part 27.54, Part 2.1055(d)(2)
Limit:	±2.5 ppm for Band 5 Within authorized band for Band 41
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer (SA) and a Signal Source (SS) are connected to a Divider. The Divider is connected to the EUT (Equipment Under Test) inside a Temperature & Humidity Chamber. A Power Source is also connected to the EUT.
Test procedure:	1. Set chamber temperature to 25°C. Use a variable DC power source to power the EUT and set the voltage to rated voltage. 2. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency. 3. Reduce the input voltage to specify extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data (worst case):
LTE Band 5 part:

Reference Frequency: LTE Band 5(10MHz) Middle channel=20525 channel=836.50MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	4.20	98	0.117155	±2.5	Pass
	3.60	80	0.095637		
	3.50	77	0.092050		
16QAM					
25	4.20	90	0.107591	±2.5	Pass
	3.60	76	0.090855		
	3.50	80	0.095637		
Note: Only the worst case shown in the report.					

LTE Band 41 part:

Reference Frequency: LTE Band 41(10MHz) Middle channel=40640 Frequency=2595.00MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	4.20	99	0.038150	Within authorized band for Band 7	Pass
	3.60	86	0.033141		
	3.50	60	0.023121		
16QAM					
25	4.20	91	0.035067	Within authorized band for Band 7	Pass
	3.60	87	0.033526		
	3.50	65	0.025048		
Note: Only the worst case shown in the report.					

8 EUT Constructional Details

Reference to the test report No. JYTSZB-R12-2100455

-----End of report-----